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An Index to the Sixty-fifth Volume of THE RAILWAY GAZETTE covering the issues from July 3 to December 25, 1936, is presented as a Supplement to each copy of this week's issue.

Christmas Aftermath

IT was, we remember, in the period between Christmas and the New Year that we took our first unwilling steps in literature. Under the stern parental eye, we then addressed to all from whom we had received seasonable favours, letters congratulating them upon their good taste, and protesting our unworthiness to be the object of their bounty. A similar task falls upon us today, but by now we have outgrown that time-serving materialism which once caused the fulsome phrase to flow so readily after a little practice. In any case, we are conscious that what used to do for the benign and indulgent army of aunts and uncles, might not wash with the enterprising railways and far-sighted manufacturers to whom we must now address ourselves. The extent of our indebtedness can be judged from the list of Christmas cards, calendars, and diaries published on page 8 this week. We, the fortunate target of so much benevolence, must take this opportunity of thanking all who have remembered us at the Christmas and New Year season, and of reciprocating to the best of our ability the almost overwhelming volume of neatly phrased, artistically conceived, and usefully presented expressions of good will which we have received.

Cordoba Central Purchase

As the result of lengthy negotiations an agreement was reached on December 29 for the sale of the Cordoba Central Railway to the Argentine Government, subject to the approval of Congress and of the three classes of the company's stockholders. As consideration for the transfer the company is to receive £8,800,000 nominal in State Railway sterling bonds guaranteed by the National Government, bearing interest at the rate of 4 per cent. per annum with a 1 per cent. sinking fund, the bonds to be blocked for five years. A payment of £700,000 will also be made in cash and in addition a sum in respect of stores on hand. As soon as possible after the approval of Congress a scheme of arrangement between the three classes of stockholders will be submitted for their consideration. The nominal capital outstanding consists of £8,000,000 of 4½ per cent. first debenture stock, £6,373,422 of 5 per cent. income debenture stock, and £6,178,355 of consolidated income stock, which represents a consolidation effected in 1932 of the former first preference, second preference, and ordinary income stocks. Formed in 1887, the company is an amalgamation of the Central Northern (purchased from the Argentine Government), the North West Argentine, the Cordoba & Rosario, and the Cordoba Central Buenos Ayres Extension Railways. The original line of 128½ miles from Cordoba to San Francisco was opened in 1889. At present the total length of the system is 1,218 miles on the metre gauge, connecting with the State Railways. As these are also on the metre gauge the acquisition will give the State Railways the direct access to the Federal Capital which they have long desired.

* * * *

Two Weeks' Traffics

The 52nd week's figures for the four group companies show a general improvement in goods and passenger train receipts compared with the corresponding week of 1935. Owing to Christmas Day falling on a Friday this year the comparative figures are disturbed to some extent. If the last two weeks are taken together passenger train receipts are up by £193,000, merchandise receipts by £273,000, and coal class receipts by £75,000, giving a total increase over the Christmas period of 1935 of £541,000. The total increase for the 52nd week is £624,000, thus making the increase for 52 weeks £5,056,000, or 3.34 per cent. For the 52 weeks the totals

	51st and 52nd Weeks				Year to date	
	Pass., &c.	Goods, &c.	Coal, &c.	Total	Inc. or Dec.	%
L.M.S.R. ..	+ 75,000	+ 126,000	+ 64,000	+ 265,000	+ 2,512,000	+ 4.13
L.N.E.R. ..	+ 34,000	+ 61,000	+ 6,000	+ 101,000	+ 1,327,000	+ 2.97
G.W.R. ..	+ 36,000	+ 74,000	+ 7,000	+ 117,000	+ 754,000	+ 2.97
S.R. ..	+ 48,000	+ 12,000	- 2,000	+ 58,000	+ 463,000	+ 2.27

for 1929 to 1936 are:—1929, £180,500,000; 1930, £170,600,000; 1931, £156,600,000; 1932, £143,300,000; 1933, £143,900,000; 1934, £149,200,000; 1935, £151,300,000; 1936, £156,300,000. Thus it will be seen that the 1936 total is within a quarter of a million of 1931. It should be noted that the totals are for 52 weeks and are not the yearly totals. There will be two extra days in 1936 as against one extra day in 1935.

* * * *

Mexican Railway Half-Year

An improvement of 8.17 per cent. in the gross receipts of the Mexican Railway Company for the first six months of 1936, as compared with the first half of 1935, was entirely wiped out by the increase of 18.31 per cent. in working expenditure. The heavier burden of expenditure is to a certain extent due to the increased appropriation

for special renewals, but the chief factor is the additional remuneration of employees which the company has been obliged to concede under agreement with the labour unions. In the accompanying table results are compared for the first six months of 1936 and 1935 respectively:—

	1936	1935
Passengers	958,040	843,185
Paying goods, tons .. .	472,730	454,592
Traffic train-kilometres .. .	1,236,848	1,189,315
Average haul, km. .. .	193.31	202.17
Operating ratio, per cent. .. .	98.52	90.07
	Pesos	Pesos
Passenger receipts	1,805,644	1,535,976
Goods and live stock receipts .. .	4,785,538	4,520,525
Gross receipts	6,895,345	6,374,733
Working expenses	6,793,154	5,742,005
Net receipts	102,191	632,728

At the standard rate of exchange net receipts amount to £5,677, against £35,152 a year ago. Total debit to net revenue is now £626,492.

* * *

Overseas Railway Traffic

In comparing the Argentine railway traffic position at the end of the 26th week in 1936 with that for the corresponding week in 1935, important changes for the better will be seen for the Buenos Ayres & Pacific, Buenos Ayres Western, and Central Argentine. At this time a year ago the Pacific had an increase of £156,037, the Buenos Ayres Western a decrease of £11,178, and the Central Argentine an increase of £61,680. On the Buenos Ayres Great Southern, however, there was a decrease of £52,774, but this company is now rapidly overtaking its arrears.

	No. of Weekly Week Traffic	Inc. or Decrease	Aggregate Traffic	Inc. or Decrease
Buenos Ayres & Pacific .. .	26th 100,186	+ 19,457	2,020,638	+ 74,708
Buenos Ayres Great Southern .. .	26th 147,581	+ 14,561	3,014,659	+ 102,047
Buenos Ayres Western .. .	26th 57,506	+ 13,088	1,107,399	+ 35,804
Central Argentine .. .	26th 155,664	+ 30,535	3,633,402	+ 591,019
Canadian Pacific .. .	51st 588,600	+ 58,000	26,958,200	+ 1,712,800
Bombay, Baroda & Central India .. .	37th 279,000	+ 33,750	5,937,450	+ 220,875

The Great Western of Brazil for the 52 weeks of 1936 has an increase of £8,500, and the Leopoldina one of £106,468. Up to the end of November, 1936, the Canadian Pacific had a gross increase of £1,642,400, and a net increase of £135,600.

* * *

Buffet Cars

The North Eastern Area of the London & North Eastern Railway is to be congratulated on the further extension of its buffet car services that is announced in the 1937 L.N.E.R. coach-building programme. As a result, no doubt, of the success of the Newcastle—Carlisle cars introduced last summer, buffet cars are now to be run on the hourly expresses between Newcastle, Sunderland, West Hartlepool, Stockton, and Middlesbrough, and also on the Leeds—York—Scarborough trains. In North Eastern England a buffet car technique has been developed which is quite the best of its kind in England; the *ménú* of each car comprises a great variety of items from which dainty and appetising light meals, suitable for all hours of the day, and at most reasonable prices, can be compiled; and the buffet counter can equal any *café* in the scope of the refreshments that it displays to view. There is room for a considerable expansion of this popular line of catering on wheels in Great Britain. In many restaurant cars the Olympian standard of "no meat meal under 3s. 6d." still obtains and thereby, we imagine, drives away not only the passenger of more slender resources, but also the passenger of slender appetite, who is not inclined to pay for more than he is able to eat. It is in this respect also that the L.N.E.R. has given a lead to the country, for at all meals in its ordinary restaurant cars, whether

breakfast, lunch, or dinner, its passengers are permitted, if they so desire, to take a "short" repast at a reduced price.

* * *

The Definition of Punctuality

With the increasing attention that is being paid to the punctual running of trains, the word punctuality is taking to itself special railway meanings. In other words, for operating purposes a train may be considered punctual although its actual performance falls short, within an agreed margin, of the perfection which the word connotes. As we have previously observed in connection with one of the great British main-line railways, this agreed margin in the case of arrivals is five minutes, and we were therefore interested to notice recently among some old railway circulars and orders a similar provision in regard to departures. As long ago as October 25, 1853, a general order over the signature of Thos. K. Rowbotham, the General Manager, was issued by the North British Railway on the subject of the starting of trains. It said "Guards, engine drivers and others are hereby informed that in future any passenger train, departing from Edinburgh station within five minutes of the appointed time will be considered as having started at proper time. Thus, supposing that the 5.55 p.m. Mail should depart at 6.2 p.m. it will only be considered as having started two minutes late."

* * *

The First "Limited" Train

The word "limited" in connection with a train of fixed accommodation has come to be so generally used—and often misused—that it is interesting to have a reminder of its origin. Such a reminder was given recently by the Pennsylvania Railroad in connection with the 55th birthday of its famous train The Pennsylvania Limited. This train, which was inaugurated on November 19, 1881, under the name of the New York and Chicago Limited, is claimed with probable justification to have been the first in the world designated as a "limited." The original schedule provided for a westbound run of 26 hr. 36 min. and an eastbound run of 26 hr. 4 min., which were very fast timings for the period. In September, 1891, the name of the train was changed to the familiar title of The Pennsylvania Limited, but its continuity of regular service dates back to the inauguration of ten years earlier, since when not a single trip has been missed. On its more than 40,000 trips over the 908 miles between New York, Philadelphia, and Chicago, the "Limited" has covered over 36,000,000 miles and has carried upwards of 7,000,000 passengers.

* * *

The Pennsylvania Limited

Both in make up and colour, the "Limited" has passed through various changes since its first days of service, when the train was composed entirely of what were then known as "Pullman Palace" cars. Through passengers were accommodated in the type of Pullman known as "hotel" cars. These were sleeping cars which, in addition to the regular sections of berths and drawing rooms, were equipped with good sized kitchens from which *table d'hôte* and *à la carte* meals were served. In 1882 dining cars were added, the hotel cars were discontinued, and regular sleeping cars substituted; an observation car was added in 1889. The original livery of dark olive was changed in January, 1898, to a striking combination of jade green below the window sills and a rich cream above, and the effect was then described as "something which has never been seen on a railroad train before." While this colour scheme was in use, railway employees dubbed the train the "Yellow Kid." In the autumn of 1902

Pennsylvania Railroad standard Tuscan red was adopted and has been continued since. The Pennsylvania Limited has a further claim to distinction, as it was the first train to be lighted by electricity.

* * *

The Istanbul Underground Railway

For over sixty years the old capital of the Turkish Empire has been served by an underground railway of which comparatively little is generally known in Great Britain, although the original capital was raised here. The concession was granted by the Imperial Ottoman Government to a Monsieur Gavaud for a term of 42 years, and a company known as the Metropolitan Railway of Constantinople, from Galata to Pera, Limited was formed in England on June 22, 1872. As indicated by the title, the line extends from the shipping and commercial quarter of Galata, the lower terminus, to the residential area of Pera. It was opened with considerable ceremony on Sunday, January 17, 1875. The line is very short, the total length of the tunnel being but 634 yd. and the rails 672 yd. The difference of level between the extremities is 200 ft., the average gradient 1 in 10, and the greatest depth of the tunnel beneath the surface 80 ft. It was at one time intended to extend the railway from Galata, under the Golden Horn, to Stamboul, but this was never undertaken. The line is double track and is cable operated, with the cars balancing one another.

* * *

Conveyor Band Installation at Hanover

To replace a goods sorting shed at Hanover, destroyed by fire in 1930, the Reichsbahn is building a new one, expected to be finished early in 1938; this is to have conveyor band equipment such as is already in use for similar purposes at Magdeburg (Rothensee), and Linz in Austria. There was also one at Belira, in Germany, but it was abandoned after a time. None of these was called on to handle the quantity of traffic expected at Hanover, which will probably reach 3,000 tonnes daily, to be sorted to some 300 destinations; the average distance items will require to be moved will be 180 m. (590 ft.). This will enable more efficient working to be obtained from the installation than has been the case at the other places mentioned. The new shed will have 12 tracks inside, accommodating over 400 wagons, and one along the outer wall, chiefly for night use. The conveyor band will form two U loops, each embracing 4 tracks, the other 4 being between the loops; the outer end of the loop will be carried on special lifting gear, to raise the band clear for the passage of vehicles at certain times. The band will be 1,500 m. (1,640 yd.) long, and 1.5 m. (4 ft. 11 in.) wide, and will travel at 3 km.p.h. (1.86 m.p.h.). Special switches, placed at intervals, will enable it to be stopped in an emergency. It will be necessary to transport only certain goods by trolley for short distances, which it is hoped will reduce risk of damage. Steps are being taken to plan the working arrangements in detail, and to provide every facility for enabling the conveyor system to be worked to advantage.

* * *

Permanent Way Maintenance

Some idea of what is involved in the work of maintaining the permanent way of British railways may be gathered from the analysis we publish on pages 14-19 of this issue. An indication is also given of the effect of traffic increase on wages and materials expenditure, pointing to the necessity of modifying old methods as traffic intensifies. Beyond a certain number of trains per track every hour of the normal working day, permanent way

maintenance is of necessity confined to such hours of the night as give longer intervals between trains. Wages costs are heavier then, and the fact that, according to our analysis, they decrease with increasing traffic density, while the cost of materials increases, suggests that there is a critical point at which it is more economical to give up daylight work and concentrate track maintenance within the brief period of comparative calm during the night. The shortness of the time then available would necessitate the maximum use of mechanised methods. Alternatively, permanent way design may have to be modified to reduce wear and tear to a minimum.

* * *

A Noteworthy Articulated Locomotive

Designed and built for fast freight service and the ability to run at from 60 to 65 m.p.h., the new single-expansion 2-6-6-4 type articulated locomotives of the Norfolk & Western Railway rank among the most powerful and interesting types yet constructed for service in the United States. The engines of this series, each of which is capable of developing a tractive effort of 104,500 lb., have four 24 in. by 30 in. cylinders, and the overall length of the engine and tender is 120 ft. 7 in. Naturally the weight of a locomotive of this kind in full working order is considerable, it is here 423 tons 10 cwt., but when regarded from the point of view of the work that the engines are able to do, the matter assumes a correctly proportionate aspect. Tests have shown that the locomotives can each handle, without difficulty, trains of 4,300 tons on grades of 1 in 200 at 25 m.p.h., whilst on comparatively level tangent track a speed of 64 m.p.h. has been obtained with a train weight of 7,500 tons. In the article on page 20 of this issue there will be found a chart showing the drawbar pull and drawbar h.p. plotted from dynamometer tests made with one of the engines when it was handling a freight train of relatively low tonnage at high speed, and this graphically indicates what the engines are capable of in both directions. For a freight locomotive, and particularly one of the articulated type, the development of an indicated h.p. with less than 85 lb. of total engine weight and a drawbar h.p. with 90 lb. of total engine weight cannot but be regarded as a notable achievement.

* * *

Our Expanding Railway Services

The British railways enter upon 1937 with a confidence and reputation based upon a year of outstanding achievement in 1936. The many facilities they offer for accelerated transport of passengers and freight are summarised by Sir Harold Hartley, Vice-President, L.M.S.R., in an article contributed to *The Glasgow Herald Trade Review*, where emphasis is laid upon the importance of certain facilities which are sometimes overshadowed in public estimation by the exploits of high-speed trains. Speeding-up in transport depends not only upon acceleration, but upon the availability of equipment for handling any traffic that may offer. For example, there are now twenty different types of container, all specially designed for the expeditious handling of various classes of commodities. Wagon design, too, is being pursued in specialised directions, and express goods trains now include vans for the conveyance of bread, enabling loaves to be sent from the bakehouses to breakfast tables far outside the range of the ordinary baker's round. The stock of vehicles for exceptional loads, ranging up to 150 tons, has also been augmented. As to passengers, they are better placed than ever to enjoy the steadily improving services now being offered them, thanks to the companies' interest-bearing "Save-to-Travel" scheme.

Centenaries of 1837

THE year 1837 was important both in the national history of this country and also from the railway aspect, for it marked the beginning of a new era which may not unjustly be considered "modern." When the year opened King William IV occupied the throne, and it is enough to say that he was also King of Hanover to emphasise the gulf between those times and the present. He died on June 20, 1837, and the Victorian era began. As a woman she was debarred by the Salic Law from succeeding to the Hanoverian throne, and Great Britain was thus severed from a direct Continental alliance that might have affected profoundly the course of European history. The same year that marked the accession of Victoria also saw the "Railway King" enter into prominence, for George Hudson was appointed Chairman of the York & North Midland Railway and in April, 1837, was able to set the contractors to work on that important trunk line; in the autumn of the same year he became Lord Mayor of York. At first the Royal and railway thrones failed to meet, and it was not until five years later that Queen Victoria made her first journey—from Slough to Paddington on the G.W.R.—and "thoroughly enjoyed it." After another five years "King" Hudson personally guided Her Majesty on her journey from Tottenham to Cambridge on the Eastern Counties Railway on July 5, 1847. By this time Hudson had more than a thousand miles of railway under his control. Before referring in detail to the railway events of a hundred years ago, mention may perhaps be made of a personal anniversary that was also in its way a landmark. Since May, 1835, when *The Railway Magazine*, the oldest of our constituent papers, had been launched, the railway industry had been served with its specialised journal, but only monthly. Now no longer did this suffice, and on Sunday, October 29, 1837, No. 1 of a new weekly paper called *The Railway Times* made its appearance, and thereafter we and our predecessors have been published regularly every week. *The Railway Times* absorbed *Herapath's Railway Journal* (as *The Railway Magazine* had become) in 1903, and itself became part of THE RAILWAY GAZETTE in 1914.

Last year, in the editorial article on centenaries of 1836, which we included in our issue of January 3, we pointed out that money was plentiful in Great Britain and investors were anxious to find a medium which promised a good return on their capital. The continued success of the Liverpool & Manchester Railway held out the promise of satisfactory dividends, and thus began the movement which resulted in the first railway boom. It was comparatively shortlived, however, and may be said to have spent its force by the time Queen Victoria succeeded to the throne at the death of William IV on June 20, 1837. An illustration of this is provided by the railway record of the last Parliamentary session of William IV. As shown by the extract from *The Railway Magazine* of a hundred years ago (given on page 9), notice was given of 118 intended applications to Parliament for railway Bills. Of these 85 were for new lines; 28 for extensions, deviations, or branches; 4 for raising further capital; and 1 for extending the authorised time for completing an undertaking. It appears that 79 of these Bills were actually introduced into the House of Commons and only 42 of them were passed, 34 having been either withdrawn or lost at various stages in that House and 3 in the House of Lords. Of the 42 Bills passed, 14 only were for new railways; 5 for branches from, or the extension of, lines already authorised; 10 for deviations and alterations; 6 for the amendment or enlargement of existing powers; 5 to enable additional capital to be raised; 1 for the incorporation of an existing company; and 1 for extend-

ing the time for completing an undertaking. The aggregate authorised length of the 14 new railways was 471 miles, and their total capital £8,090,500. A grand total of 543½ miles was authorised in 1837, making with that sanctioned in previous years 2,469½ miles.

Of the new incorporations probably the most interesting was the London & Brighton Railway, which received its Act on July 15 and represented a solution of a hotly-debated problem as to the best route in which five rival companies were finally united in the undertaking as sanctioned by Parliament. The Lancaster & Preston Junction Railway and the Sheffield, Ashton-under-Lyne & Manchester Railway (the predecessor of the Great Central Railway) were both incorporated on May 5, but the Manchester & Birmingham Railway (June 30) and the Maryport & Carlisle Railway (July 12), by receiving the Royal Assent to their Acts a few weeks later, were Victorian companies. In the sphere of lines opened, the year 1837 had the distinction of seeing for the first time in Great Britain more than 100 miles of new railway—actually 137—brought into service, making a total of 540 working at the end of the year. By far the most important was the Grand Junction Railway, the first trunk line to be completed, which was opened throughout (and not in the customary sections) on July 4. What afterwards formed the southern section of the L.N.W.R. main line, namely, the London & Birmingham Railway, was opened from Euston to Boxmoor (24½ miles) on July 20, and extended 7½ miles to Tring on October 16. The remaining openings of the year were of a minor character, and comprised in England sections of the Newcastle & Carlisle; the Clarence (the Byers Green branch) in March; and the Durham & Sunderland (Pittington to Sherburn House, and the Quarrington branch as far as Whitwell) in November. In Scotland three small railways, all originally worked by animal power, were brought into service. These were the Paisley & Renfrew, 3½ miles (April); the Newtyle & Coupar Angus, 5½ miles; and the Newtyle, Eassie & Glamis, 6½ miles. Another aspect of 1837 is that of the railway personalities who came into prominence at that time, but we refrain from mentioning them here as they form the subject of a short article from a correspondent which we publish on page 13.

* * * *

De-Rating Rebates

THE decision of the Railway Rates Tribunal on December 18 to confine railway freight rebates as from today (January 1) to export coal, milk, and livestock, has been followed by an announcement by the G.W.R., L.M.S.R., and L.N.E.R. Companies relative to the dock de-rating rebates. These rebates are granted in respect of railway-owned dock undertakings under the provisions of the Local Government Act, 1929, but while this Act, as amended by the Railway Freight Rebates Act, 1936, enumerates the traffics on which railway freight rebates are to be given, it leaves the companies free to decide the nature of the traffics on which they will pay dock de-rating rebates, and the quantum of such rebate. Although the reduced assessments for local rates of the main line companies' railway freight hereditaments have now been determined, the apportionment of the revised assessments to the railway companies' dock undertakings has not yet been completed. There is little doubt, however, that the sums to be paid into the dock de-rating funds in future will be considerably less than heretofore. The scales of dock rebates granted by the companies hitherto have always been different in certain respects owing to the varying commodities dealt with, the Southern Railway, for instance, being mainly concerned with

Southampton Docks which is primarily a passenger port. The G.W.R., L.M.S.R., and L.N.E.R. Companies all own ports where a substantial coal shipping business is carried on, and their rebates granted from coal shipping charges have always been the same, although the other rebates have differed materially.

The announcement of these three companies of December 23 indicates that this practice is to be continued, as their rebates in respect of coal, coke and patent fuel, and pitwood, pitprops and mining timber are identical. In the case of coal, however, the rebate is to be reduced from $\frac{3}{4}$ d. a ton to $\frac{1}{4}$ d. a ton as from January 1, 1937, and confined to coal, coke and patent fuel exported as cargo or bunkers to foreign destinations, and to Ireland, the Isle of Man, and the Channel Islands; also bunkers for fishing vessels shipped at the port. Formerly, it was given on all coal shipped, irrespective of destination. The G.W.R. and the L.M.S.R. at Swansea, will also grant an additional $\frac{1}{4}$ d. a ton instead of $\frac{3}{4}$ d. a ton on coal shipped from fully loaded 20-ton wagons. In the case of pitwood, pitprops, and mining timber the three companies are continuing the existing rebate of 10 per cent. of the wharfage charges. The Great Western Railway is discontinuing the whole of the other rebates on iron and steel, tinplates, cement, &c., and the L.M.S.R. is following a similar course, except that this company is granting rebates of $7\frac{1}{2}$ per cent. of the dues on trawlers, and 5 per cent. of the dues on all merchandise on which no other rebate is granted. The L.N.E.R. is restricting future rebates, other than those mentioned above, to $\frac{1}{4}$ d. a ton on iron and steel shipped to foreign and certain other destinations, and $7\frac{1}{2}$ per cent. of the wharfage charges on fresh fish and imported wool. As the rebates are based on estimates of the rate relief accruing to the companies and the volume of the traffic likely to pass, the companies reserve full right and liberty to make such adjustments from time to time as will recoup them for any loss which they may sustain by reason of the estimates of rate relief exceeding the actual relief allowed on the volume of traffic on which the scales have been prepared having increased.

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Nigerian Railway Annual Report

THE annual report of the Nigerian Railway and Government Colliery for the year ending March 31, 1936, in addition to describing the results of the railway and colliery working for the year, is notable for the fact that it is the last one which will be signed by Mr. G. V. O. Bulkeley, C.B.E., who has now taken charge, as Director of Transport, of the work of co-ordinating the road, river, dock, and railway activities in the Colony of Nigeria. This very interesting development in Colonial policy has already been commented upon in THE RAILWAY GAZETTE. Originally the recommendation was for the fusion of the State transport services (*i.e.*, railway, colliery, marine, and port engineering) into one commercialised department. It was, however, decided by the Government not to go so far as this but for the transport departments each under its own head to be co-ordinated as from May 1, 1936, under the executive control of a Director of Transport whose functions also include advice to the Government on air, road, and inland waterway transport, a Transport Advisory Board also being created, the Chairman of which is the Director of Transport. In describing the new post, Mr. Bulkeley says:—

The Director's office will be regarded as an extension of the various transport departmental headquarters, thus avoiding formal correspondence and duplicating files.

The working of the railway and colliery is now under

the general managership of the Hon. J. H. McEwen, F.S.I., M.Inst.T.; as he was previously Principal Assistant to the General Manager, continuity of policy is assured. The railway undertaking, which is the largest of the Government-owned and worked colonial systems, comprises 1,767 route miles of 3 ft. 6 in. gauge track, and 133 miles of 2 ft. 6 in. gauge line. It was constituted on January 1, 1914, by the amalgamation under one administration of the two systems previously disconnected and operated separately that were based upon Lagos and Port Harcourt respectively. The following statistics of operation during the year under review are of interest:—

	PRINCIPAL STATISTICS		
	1933-4	1934-5	1935-6
Gross receipts	£1,885,660	£2,027,036	£1,966,012
Expenditure	£1,086,126	£1,054,177	£1,338,296
Surplus	£799,534	£972,859	£627,716
Operating ratio	57.59	52.01	68.07
Interest on capital	£1,046,202	£1,047,173	£1,048,729
Revenue from passenger traffic	£243,349	£230,270	£262,038
Revenue from freight traffic	£1,582,708	£1,721,825	£1,621,254
No. of passengers carried	5,179,206	5,080,016	7,938,995
Average receipt per passenger	9d.	9d.	7d.
Goods tonnage	627,475	660,615	709,102
s. d.			
Average freight receipt per ton	50 6	52 2	46 7

It will be noticed that the surplus of receipts over expenditure fell by nearly £250,000. This is due to the fact that a recent committee has revalued the railway capital assets and reduced them by a sum of £292,000. This amount had to be found from revenue, and if it is not included, the financial results of the railway show an improvement over the preceding years. No contributions were made to the Renewals Fund but a fundamental change in the financial structure of the railway has been made. A section of line on the Eastern Division of the system is to be regarded as from April 1, 1936, as constructed for Colonial development, and the finances of the railway are to be relieved of the interest charges on this section of the line. Under this relief the railway is placed on a commercial basis and will be held responsible for meeting all its commitments including interest on capital (other than that of the section mentioned), and contributions to renewal funds. In commenting on these new arrangements the General Manager states:—

Under the financial re-arrangement, it is also hoped gradually to build up a substantial railway reserve, in order to meet such contingencies as the failure of a main export crop, and to avoid the raising of railway rates when trade is declining.

One of the principal crops in Nigeria is groundnuts and this involves a haul of some 600 miles. Unfortunately and quite unexpectedly this crop partly failed early in 1936; special steps are, however, being taken to ascertain more accurately the crop prospects in future years. This is an important feature on a system such as the Nigerian Railway because workshop programmes and other schemes have to be drawn up on estimates of the probable big traffics. Apart from the groundnut tonnage that of almost every other export commodity increased.

Locomotive running costs show a very considerable reduction as follows:—

	1934/5	1935/6
Per engine-mile pence	12.02	10.94
Per engine-hour	126.12	115.65
Per 1,000 gross trailing ton-miles	55.97	52.03

Collection and delivery services have been instituted in Lagos, and technical research, to which reference has been made in previous reports, has been continued. A suggestion scheme has been inaugurated, but we notice that it does not appear to have been very successful. In this connection it may be interesting to refer to the trial made

on the Great Indian Peninsula Railway of offering a large prize for the best suggestion received during a given period rather than awarding small amounts for individual suggestions, and it may be that this is a more attractive principle to the native mind.

A remarkable increase in the number of passengers conveyed will be noted. This was not due to any change in the basis of the third class fares, which are a $\frac{1}{4}$ d. a mile, but to a general increase in the desire to travel. Dealing with the speeds of trains on Colonial railways the General Manager points out that the present-day running of trains at speeds of 60 m.p.h. on the 3 ft. 6 in. gauge tracks of the South African and New Zealand Railways has set up new standards, and he points out that, while the Nigerian Railway does not need such a speed as this, a modest increase in speed would enhance the line capacity and improve the use of rolling stock. Mr. Bulkeley states:—

The matter is governed by two factors: (i) the weight, stability and curvature of the track, and (ii) the loading of trains. The locomotive has always been capable of better speeds, but has been held back by these two factors. The first desideratum is to consolidate the track as funds become available. The second is so to load trains that the sectional speeds allowed can be made use of.

The railway road feeder services continue their work and new services are under consideration. One of the coal mines controlled by the railway worked out during the year. This was the famous Udi mine and the term "Udi coal" so long known on the West Coast of Africa now passes into history. Considerable mechanisation of clerical work for statistical production has been introduced. This is interesting as one often hears that with cheap labour mechanical appliances cannot be justified in the Colonies. It has never been our view that this is axiomatic and little by little improved methods are being introduced. Considerable activity took place with regard to locomotive carriage and wagon work, including re-boiling of certain engines and renewals of coaching stock. An illustration appears in the report of the new type of cattle wagon introduced to take the large horned cattle of the country. New general purpose Beyer-Garratt locomotives have been delivered and it may be interesting to quote the following extract from the report in regard to passenger coach bogies:—

After extended trials of various types of bogie extending over a period of years, the Chief Mechanical Engineers of the Nigerian and Gold Coast Railways have decided to standardise on the Sheffield-Twinberrow design. Following a recent conference between the two officers, reasons were given for the choice:—

- (a) Superior suspension of coach body on a two-point system tending to eliminate swaying.
- (b) Easy riding qualities.
- (c) Even wear of tyres.
- (d) Reduced wear on journal collars.
- (e) Built up largely of standard sections with a choice of riveted or welded construction.

The Nigerian Railway has adopted the welded type of this bogie, in which the loosening of bolts and rivets is eliminated and which gives a weight reduction of 336 pounds per coach. A further weight reduction is obtained by the use of Framwell welded steel axle-boxes, which work out at 36 per cent. lighter than the cast type. Roller bearings have been fitted experimentally to one coach and Isothermos constant-oil-film boxes to four others.

A considerable programme of engineering works is also in being for strengthening bridges, and in one case (at Akerri) the widening of the river and the lengthening of the bridge is being undertaken in order to avoid annual trouble through washouts occurring at this place.

Queensland Government Railways

FINANCIAL results of the Queensland Government Railways for the twelve months ended June 30, 1936, were not equal to those of the very satisfactory year 1934-35, as is shown by the report received from Mr. J. W. Davidson, Commissioner for Railways. Reduced tonnage of wool conveyed owing to the depletion of flocks, and the reduction of 10 per cent. in wool freights as from August 1, 1935, were the principal causes of the decrease of £503,236 in gross earnings. The increase of £94,721 in expenditure was more than accounted for by the payment of automatic increases to the staff, variations in award conditions, increased payment on account of retiring allowances, annual and extended leave, the employment of additional staff and working of extra shifts in workshops to cope with repairs to rolling stock, extra cost of material used in rolling stock repairs, additional cost of ballast and sleepers, the employment of temporary labour for permanent way maintenance, and the additional cost of flood damages. Net earnings were, in consequence, £597,957 lower, and represented a return of £3 18s. 7d. per cent. on capital of opened lines, as compared with the record figure of £5 12s. 9d. for the previous year. Interest charges (£1,588,397) increased by £14,315, and the final result of the year's operations was a deficit of £117,751, against a profit of £494,521 in the year 1934-35. Operating figures are compared in the accompanying table:—

	1935-36	1934-35
Miles open	6,467	6,467
Passenger journeys	25,158,926	24,249,641
Goods and minerals, tons	4,234,877	4,418,041
Train-miles	12,277,204	12,869,974
Operating ratio, per cent.	77.60	70.73
<hr/>		
Passenger revenue	1,469,556	1,448,924
Goods and minerals, receipts	3,889,868	4,207,810
Total earnings	6,564,960	7,068,196
Working expenses	5,094,314	4,999,593
Net earnings	1,470,646	2,068,603

Country passenger journeys fell off by 112,465, largely due to the aftermath of the drought of the previous year and to the floods in North Queensland, but earnings from country travel increased by £3,556 because of the greater proportion of long-distance journeys. Revenue from first class suburban travel was £1,205 lower, but second class suburban receipts improved by £18,281. In goods traffic wool receipts were £114,280 lower on account of the 10 per cent. rate reduction and of the smaller tonnage caused by the loss of sheep from the drought. Revenue from hay, chaff, and maize was £128,264 lower because of the heavy tonnage of these commodities conveyed in the previous year as fodder for stock in the drought-stricken areas. Minerals, other than coal, produced an additional revenue of £22,033, principally due to the new traffic in zinc concentrates from Mount Isa mines. As a result of the programme of strengthening lines, regrading of sections, and greater use of heavier types of locomotives the average goods train load is now 263 tons, compared with 211 tons in 1925-26. The duplication of the six miles of line between Stewart's Creek (the junction of the North Coast and Great Northern Railways) and Townsville, was completed and opened for traffic on March 22, 1936. Two more Sunshine Express trains were put into service during the year. Following on satisfactory results obtained with an experimental diesel engine, four engines of the Gardner L.W. 102 h.p. type were purchased, and two rail motor trains fitted with these engines were placed in service before the close of the year. Another has since been completed. Since the close of the financial year the Government has appointed a Royal Commission to enquire into transport matters.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

The Bristolian in Bad Weather

55, Kingsdown Parade,
Cotham, Bristol, 6
December 19

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—I am pleased to see that "Viator," in your issue of December 18, draws attention to the punctuality of this service under the unusually bad weather conditions which we have experienced during the past two months. I have made several journeys in both directions when fog reduced the visibility to a matter of a few yards for the bulk of the distance, and was particularly struck by the steadiness of running and absence of those violent and frequent checks which normally mark the running in foggy weather. On the evening when visibility was at its worst (nearly 100 miles of dense fog) the late arrival on the up journey was only 16 minutes. Without doubt this is due almost entirely to the equipment of the locomotives and track with automatic train control which obviously enables a driver to maintain, in comparative safety, a considerably higher average speed than would otherwise be possible. The men are unanimous in their praise of this equipment, and one can well imagine the reduction in strain on the crew which the installation brings about.

Yours faithfully,
C. R. CLINKER

Tossing the Boomerang

Coll-Earn,
Auchterarder,
Perthshire
Christmas-Day, MCMXXXVI

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—We Scots are tolerable only because we stay in our remote home Kingdom and tell tales against ourselves to add to the gaiety of the nations. So sobered by this festal morn I recall the times of old and, true to type, fire off for you a flight of my self-recoiling boomerang.

Wilson Worsdell (Chief Mechanical Engineer of the real N.E.R.) said to a conference of his co-locomotive chiefs, "When I hear that fellow Macdonald talking to a gathering of Gen: Mans: he seems like an almighty divinity talking to the black beetles."

I was very often at St. Rollox working out with the famous John F. M'Intosh (the Caledonian locomotive chief) his ever larger and larger engines, so far ahead of their times. May I boast here of my care to have funnels of architectural beauty and also of my new shade of strong blue in place of a too "Navy" one? Now, M'Intosh was a true Highlander though born at Montrose and so spoke a blend both paternal and Lowland. *E.g.*, his great cry was for "big bilers"; not pills but kettles. One day after I had given him two months respite I walked into his room. He was surrounded by a galaxy from the drawing office. He looked up and shouted. "Hullo, Maister Macdonald, how have you escaped from your assielum?" This word is too painful for me to translate.

Nigh 50 years ago General Managers looked on me as a pestiferous fellow who troubled their waters in the press and also in private—pressing for progress. Sir George Stegman Gibb (of fame on the proper N.E.R. and the "Undergrounds") with his pawky Aberdeenshire humour said to a meeting of General Managers, "When Macdonald providentially dies you will find big red letters of blood branded deep into his back:

BIGGER BOILERS.
BETTER BRAKES."

He sent me to a brother General Manager with an introduction ending, "you will find Mr. M. rather refreshing." I approached the other great man feeling like the latest

style in summer ices. He graciously asked me how he could improve things. I sent him a long homily and his chief clerk replied, "Since he got your letter Mr. — has been very ill. He hopes to be well enough to reply someday." This was not an *extra sec* jest by a very Scottish cleric but "a thing we would like better expressed" (*Punch*).

Charles Rous-Marten (the famous train-timer) wrote as if an inked fly had gone by. Wilson Worsdell told me he never read his letters but sent them round his office and each clerk or girl mapped in any word they thought they knew. The resultant mosaic from 40 brains came back to him and so he made some sense as in a fog. Rous-Marten often stayed with me here and in Edinburgh. I left the city for a few days before one visit and came home a day early and found a telegram on the hall table to, "Mrs. Macdonald. Train delayed. Do not wait dinner (signed below), My Darling." To "draw" his dry Scottish humour I sent it to my friend W. M. Acworth and asked his advice as a barrister. He replied, "Ah, you never know what these parson-like fellows will be up to!" I never saw Rous-Marten on or off a locomotive except in a full dress shiny funeral hat and a close dog-collar, which seemed put on backwards, as well as a large flat black tie like the top of a cassock. Knowing the man I could forgive a poor P.O. girl who made the best of his fearsome signature.

I remain in seasonable sobriety,
Truly yours,

NORMAN DORAN MACDONALD

P.S. As I was not the corpse I throw my best Aberdeen tale on to your scrap heap herewith.—N.D.M.

The Summer Timetables of 193?

1, Sunny Bank, Stamford Road,
Bowden, Cheshire
December 28

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—With reference to the recent article entitled "The Summer Timetables of 193?" may I suggest as a corollary that the express services to Fort William and Mallaig be transferred to the L.M.S.R. and worked from Euston to Glasgow and thence over the present L.N.E.R.? The junctions in the suburbs of Glasgow already exist. Further, if the existing connecting loop were used at Crianlarich, trains to Oban could be routed this way and save mileage.

It also occurred to me that the undermentioned cross country services (with buffet cars in each case) should be inaugurated or altered in route:—

(1) Shrewsbury—Severn Valley Line—Kidderminster—Worcester—Cheltenham—Swindon Town—Southampton—Portsmouth.

(2) The Pines Express diverted by way of the Potteries instead of Crewe, the Liverpool portion to join up at Wolverhampton; then, instead of travelling by Birmingham, to be routed by Stourbridge junction, Droitwich and Worcester to Cheltenham and thence as at present.

(3) A service Luton (L.N.E.R.), Dunstable, Bletchley, Northampton, Market Harborough, Melton Mowbray, Newark, Doncaster—Church Fenton—Harrogate, with a portion from Doncaster by way of Bridlington to Scarborough.

Yours faithfully,
EDMUND ROBINSON

LOCOMOTIVES FOR L.N.E.R. CORONATION EXPRESS.—The first five of the seventeen locomotives now under construction at Doncaster to haul the new Coronation streamlined express of the L.N.E.R. between London and Edinburgh are about to be placed in service. They are to be named: *Golden Eagle*; *Falcon*; *Merlin*; *Kingfisher*; and *Kestrel*.

PUBLICATIONS RECEIVED

"The Good Companions."—This is the appropriate title conferred upon a handy electrical testing outfit (comprising insulation and continuity testers, leads, hand books, and log book) by the maker, Evershed & Vignoles Limited, Chiswick, London, W.4. The set is housed in a neat leather case, and a descriptive folder which we have received takes the form of a half-size reproduction of this case, which opens to reveal coloured illustrations of the actual contents. Luggage labels on the outside are intended to show how widely travelled these useful instrument sets have become.

Tanganyika Railways Travel Guide.—Tanganyika Railways & Ports Services. Dar-es-Salaam. 8½ in. × 5½ in. 83 pp. Illustrated. Folding maps.—This well-produced guide book is generously illustrated and contains two good maps, one showing the physical features of the territory in contours, differently coloured for every 500 m. in altitude, and the other showing the connected through routes described in the guide and extending throughout the African continent. The text begins with a history of the territory and of East Africa, and continues with descriptions of the railway systems and ports. The Central Railway from Dar-es-Salaam, the principal port in the territory, runs through Morogoro and Dodoma to Tabora junction, whence there is a northward branch to Mwanza on Lake Victoria. Incidentally, a curious "tunnel" on this branch is illustrated, two huge boulders abutting above the line. Beyond Tabora the main line extends to Kigoma on Lake Tanganyika, where connection is made with Belgian Congo communications. The Tanga line is detached from the Central system, and connects the port, from which it takes its name, with Moshi and Arusha. From Moshi, near the great Kilimanjaro mountain, a branch line runs to Voi on the Kenya & Uganda Railway. In the Arusha district is the remarkable Ngorongoro Crater game reserve. The through services and connections throughout Africa that are linked with the Tanganyika Railways, as well as the lake services, fishing in various places, waterfalls and mountaineering, are then described, and the volume concludes with general information.

The Black Book: a Directory of Solid Fuel-Burning Appliances and Associated Equipment. 1937 Edition. London: Morgan Brothers (Publishers) Limited, in conjunction with the Coal-Burning Appliance Makers Association, 28, Essex Street, W.C.2. 10 in. × 7½ in. 304 pp. Cloth. Price 7s. 6d. net.—While primarily an alphabetical list of makers of solid fuel-burning equipment, classified both by names and products, this new directory includes some useful articles on fuel research and coal utilisation. The secretaries and other officers of various

societies concerned with the use of solid fuel contribute notes on the activities of their organisations, and Mr. C. Le Maistre, Director of the British Standards Institution, writes on progress in standardising appliances for solid fuel burning. All users of the directory will find in these articles a guide to the means of elucidating with the help of expert advice most of the practical problems they are likely to encounter. The "Black Book" also includes a register of proprietary names, and a "Who's Who" of personalities in the solid fuel and allied industries.

25 Years at King's Cross, &c. By G. H. Cator. Issued under the auspices of the Railway Benevolent Institution. London: Stationmaster, L.N.E.R., Palmers Green, N.13. 8½ in. × 5½ in. 38 pp. Paper covers. Price 1s. 0d. net.—This little booklet, in the words of the author, a railwayman of some 30 years' service, "is the work of odd moments during several years." Its purpose is to raise money for the Railway Benevolent Institution, which at the present time is spending some £75,874 a year on railwaymen, their widows, and children, who through some misfortune are in need of assistance. The contents comprise an entertaining miscellany of reminiscences, essays, short stories, and verse—most of them associated with railway life. The author tells of many personally-treasured memories of his career. There is, for instance, a description of an unexpected encounter with Lord Kitchener at King's Cross. Mr. Cator also recalls being sent out to purchase the soap for King Edward VII's royal train. There are, moreover, a number of interesting little topographical points thrown in, incidentally, in the text, such as the fact that the clock at King's Cross was exhibited at the Exhibition of 1851. Mr. H. C. Walton, General Secretary of the Railway Benevolent Institution, endorses this little brochure with a short foreword.

An Oil Firm's Jubilee.—The year 1936 marked the jubilee of Stenol Limited, the well-known London and Bradford firm of oil refiners and manufacturers. To celebrate the occasion, and also to give the many users of Stenol lubricants an insight into the conditions under which these oils are produced and tested, a handsome illustrated brochure has been published which briefly relates the history of the concern since its foundation in 1866, and gives many interesting views of the present up-to-date premises and extensive equipment. The well-equipped physical and chemical research laboratories are shown in some detail, as the firm specialises in superfine grades of oil, refined in accordance with the most recent developments, for petrol engines, diesel engines, and turbines. The head office of Stenol Limited is at Royal London House, Finsbury Square, London, E.C.4.

CHRISTMAS CARDS, CALENDARS, AND DIARIES

Under this heading we annually acknowledge the large number of Christmas tokens which we receive. The originality of our friends in conveying their good wishes now makes it hardly adequate, for such items as handsome blotters and packs of playing cards are included among the more usual forms of Christmas and New Year remembrances. Christmas cards, however, remaining faithful to their traditional sentiments, but seeming to increase in artistry year by year, are still the predominating feature of our mail, and so we append first the list of those from whom we have received them:—

Associated Equipment Co. Ltd.; Australian Commonwealth Railways Commissioner; W. G. Bagnall Limited; Beckett, Laycock & Watkinson Limited; Belgian National Railways; Herr Otto Bondy; Bricovmo Products; Mr. H. G. Cabrett; C.A.V.-Bosch Limited; Compagnie Générale Transatlantique; East Midland Traffic Commissioners; General Superintendent, Dock Office, Preston; Great Western Railway—Sir James Milne, General Manager, and his office staff, Superintendent of the Line, Chief Engineer, Chief Goods Manager, Commercial Assistant to Chief Goods Manager, Mineral Traffic Manager, Superintendent of Road Transport, Publicity Officer, Divisional Superintendent, Worcester, District Goods Manager, Worcester, Major R. H. Edwards and Officers, 151st (G.W.) Railway Construction Company, R.E. (Supplementary Reserve); Mr. and Mrs. H. R. Griffiths; Head, Wrightson & Co. Ltd.; Alfred Herbert Limited; Imperial Airways Limited; Institute of Transport; Iraqi State Railways—Col. J. C. Ward and the Officers; Kenya & Uganda Railways & Harbours—the General Manager; London & North Eastern Railway—Passenger Manager (Southern Area), District Passenger Manager, London, Advertising Manager, Information Agent, Engineer (North Eastern Area), Signal and Telegraph Engineer (Southern Area), Signal and Telegraph Engineer (Scottish Area); London Midland & Scottish Railway—Chief Operating Manager, Advertising and Publicity Officer; *Mutual Magazine*, Pennsylvania Railroad employees; New South Wales Railways—Commissioner and Executive Officers; New Zealand Government Railways—General Manager and Executive Officers; Nigerian Railway—General Manager and Staff; F. Perkins Limited; Port of Bristol Authority; Queensland Commissioner for Railways; Railway Air Services Limited; Railway Clerks' Association; Railway Training Centre, R.E.—Lt.-Col. T. P. S. Greig and the Officers; Mr. W. J. Reynolds; Messrs. Sandberg; Mons. E. Simon; South African Railways and Harbours—Mr. T. H. Watermeyer, General Manager; *South African Railways and Harbours Magazine*; Southern Railway—Docks and Marine Manager, Southampton; South Indian Railway—Mr. C. A. Muirhead, Agent; Sudan Railways—General Manager and Staff; the Superheater Co. Ltd.; Swedish State Railways; James Woodhead & Sons Limited.

Caleendars, Diaries, &c.

We have also received calendars, diaries, &c., from the following:—

Associated Equipment Co. Ltd.; Blackstone & Co. Ltd.; British Insulated Cables Limited; British Oxygen Co. Ltd.; British Timken Limited; Burmeister & Wain; Carborundum Co. Ltd.; Craven Bros. (Manchester) Ltd.; D. P. Battery Co. Ltd.; the Darlen Press; Fischer Bearings Co. Ltd.; German State Railway; J. Halden & Co. Ltd.; Harland & Wolff Limited; Indian Railways Bureau; M.A.N.; Netherlands Railways; *The Railway Review*; Ruston Bucyrus Limited; Scottish Motor Traction Co. Ltd.; H. J. Skelton & Co. Ltd.; J. Stone & Co. Ltd.; the Superheater Co. Ltd.; Taylor Bros. & Co. Ltd.; Travellers' Insurance Association Limited; Union of South Africa.

THE SCRAP HEAP

In acknowledging receipt of one of THE RAILWAY GAZETTE wall calendars for 1937 a correspondent writes: "I get diaries and calendars by the dozen; but when, at last, I get the R.G.'s, my thoughts at once go back to Ben Jonson—

Ye meaner beauties of the night—
What are you when the Moon doth rise!
Can I say more?"

The Southern Railway is the owner of the Old Shoreham toll road bridge, and the duties of toll collector are combined with those of railway signalman. The original structure is believed to have been completed in 1790, or earlier, and belonged to the Duke of Norfolk until the Shoreham-Itchingfield junction line was built in 1861 when the railway company took it over. The structure, which is of wood, was repaired by the L.B.S.C.R. during the great war.

INTERNATIONAL RAILWAYS

There are exactly 50 railroad crossings of the United States—Canada international boundary, excluding car ferries and counting different railroads using the same track or set of tracks only once. This is far more than the crossings of any other international boundary in the world; the United States—Mexican frontier, for example, has only 11.

JIMMY'S TRIUMPHANT RETURN

Three Scots banged 60 sixpences apiece to go by "a one day's excursion" from Aberdeen to London and back to see Scotland beat England. This she did and they celebrated so well that at King's Cross one dropped down dead. His two friends got him on to a seat in the dark and one went to the office. There he found that the charge for coffined remains to Aberdeen ran into pounds. So at the last moment they upheld the corpse, as if well filled, and so into the train and propped him up between them. Opposite sat a nice old gentleman with grey Prince Albert whiskers à la mutton chop.

At Grantham he said, "I do not want to interfere but your friend looks ill." They said, "Maybe he does but we'll get him to Aberdeen a' richt." At York he began, "I don't want to push into your affairs but your friend looks very ill, could you not get him a glass of brandy?" "Jimmy canna' drink brandy," they replied. At Newcastle-on-Tyne the kindly soul said, "You know, I think your friend is very ill, I think he's turning yellow." "Hoots, dinna' fash yoursel' we'll get him to Aberdeen!"

At Waverley the good man returned to the rescue and said, "You know, I'm not a doctor but I see he is very ill, in fact I fear he has expired." "We ken Jimmy's expired but his ticket's no' expired!"

Newick & Chailey signal box, Southern Railway, boasts a simple home-made barometer which has functioned helpfully for some 40 years. It comprises a glass jam jar, three-quarters filled with water, with an old type olive oil flask inverted in the jar. The water rises into the flask when fair weather is pending and leaves the flask empty when wet conditions are coming.

GLASGOW, via FLEETWOOD AND ARDROSSAN.—The New and Splendid Steam-Ships *Her Majesty*, J. M. Wilson, H.C.S., Commander, and *Royal Consort*, R. Ewing, Commander, each 700 tons, and 350-horse power, leave Fleetwood and Ardrossan every Monday, Tuesday, Thursday, and Friday. From Fleetwood, on arrival of the Mail Train leaving London at 10 a.m., and from Ardrossan at 6 p.m. Passengers can be booked through from London to Glasgow, and vice versa.

Passengers leaving Ardrossan at 5 p.m. will (weather permitting) arrive in London by the mail train about half-past 8 o'clock the following evening.

For further particulars apply to Messrs. Kemp and Co., or Mr. Henry Smith, Fleetwood; at the Railway Company's offices, there; in London at 8, St. Swithin's-lane; or in Glasgow at Messrs. McKean and Lamont's, 20, St. Enoch-square.

An advertisement from "The Railway Times" of Saturday, January 4, 1845

One Hundred Years Ago

Extracts from the January, 1837, issue of "The Railway Magazine" (afterwards "Herapath's Railway Journal") and the oldest constituent of THE RAILWAY GAZETTE

NOTICES OF RAILWAY BILLS.

From a list of the notices which have been given of intended applications to Parliament for railway Bills in the ensuing session, it appears that 118 notices have been given, of which 85 are for new lines; 28 for extensions, deviations, or branches; 4 for enabling companies to raise further sums of money; and 1 for enlarging the time named in the Act for the completion of the railway.

Bristol & Exeter Railway.—We are happy to state that the Bristol & Exeter Railway is proceeding with great vigour. Two contracts, together amounting to nearly eleven miles, were lately let at Bristol. Both contracts are signed for, at prices far below the estimates which the company laid before Parliament, and not a doubt exists that the first thirty miles from Bristol will be executed 30 per cent. below those estimates. The point at which the second contract terminates, is within the verge of the remarkable and uninterrupted level which the line traverses to a distance of less than four miles from the town of Taunton. The Bristol & Exeter is the only railway

incorporated during the last session, which has hitherto contracted for the commencement of actual operations.

Greenwich Railway.—This line was opened by the Lord Mayor, from London Bridge to Deptford, December 14. About 2,000 ladies and gentlemen were present, and between 400 and 500 sat down to a dinner afterwards. At a few minutes past one o'clock the arrival of the Lord Mayor was announced, amidst the loudest acclamations of the spectators. The Right Honourable Magistrate was preceded by the Chairman, directors, and officers of the company, after whom came the Sheriffs and other civic authorities. Some routine formalities being concluded, the Lord Mayor and suite were conducted to the carriages reserved for them in the first train. Four several trains were then put in motion, and passed in review before the Lord Mayor.

Completion of the Great Viaduct on the Grand Junction Railway.—On Friday, the 9th ult., was performed the ceremony of laying the last, or key stone, of the magnificent viaduct across the Weaver at Dutton. A party of the

directors from Liverpool attended, and were met by Mr. Locke, the engineer, and the resident engineers and contractors on the line. Mr. Heyworth, as the senior director present, after placing the last stone in its bed, addressed the party present.

Ease of Draught on Railways.—"Two horses drew the immense load of 263 quarters of grain from Dalkeith to Edinburgh, on the Edinburgh & Dalkeith Railway, a distance of six miles. The weight of grain was about 44 tons, and the weight of the waggons 10 tons, making a gross weight of 54 tons!"—*Keens Bath Journal*. [Why the whole direct draught was only 4,321 lb., which one horse ought to have drawn if the road is level.—Ed. R.M.]

RUSSIAN RAILROAD.

This line (the Petersburg & Pavlovsk Railway) is only the commencement of the grand line to Moscow, and was begun in April, partially opened with horses on October 9, and publicly with locomotives on November 22, all the Imperial family being present. . . . The line runs on an embankment on which it has been found the snow will not lie; the locomotives, however, are furnished with an apparatus to clear away the sleet and snow should such accumulate upon the road.

OVERSEAS RAILWAY AFFAIRS

(From our special correspondents)

ARGENTINA

New State Railway Branch

The work of platelaying on the new 218-km. branch of the State Railways, from Joaquín V. González to Pichanal, in the Province of Salta, was completed on November 13. Construction work began in May, 1934, and 90 km. of track have been opened to service between Joaquín V. González to Río Dorado. It is expected that the railway administration will shortly declare the whole line provisionally open to goods service, with a view to relieving the traffic congestion on the main line to La Quiaca, the terminus on the Argentine-Bolivian frontier.

Buenos Aires Transport Co-ordination Law: Committee Appointed

A Decree has been issued by the Government appointing the special committee to study and make recommendations in regard to the form in which the Urban Transport Co-ordination Bill, passed by the Senate on September 30 last (THE RAILWAY GAZETTE of October 16) shall be put into force. The committee (the president of which will be nominated by the Government) will consist of representatives of the Government, the municipality, and the various urban transport entities, who have been allotted votes in the following proportions:—

	Votes.
The National Government ...	6
Buenos Aires Municipality ...	6
Anglo-Argentine Tramway Co. ...	5
Lacroze Tramway Co. ...	1
Buenos Aires Central Railway ...	1
Cia. Hispano-Americana de Obras Públicas y Finanzas ...	1
Southern Electric Tramways ...	1
City and Port of B.A. Tramways ...	1
Bus companies ...	1
Micro-bus companies ...	1

Each of the transport entities must submit to the Minister of the Interior within 15 days the name of the person or persons whom it desires to nominate as its representative. Each body shall have the right to nominate one representative for each vote, or it may vest two or more votes in the same representative. If this condition is not complied with within the period specified, the designation of a representative will be left to the Government and the municipality, each of whom will appoint three members for this purpose. The bus and micro-bus companies will choose their representatives in an election controlled by the municipality. Each member of the committee shall have a substitute, duly authorised to act for him in his absence owing to illness or other cause.

The committee shall meet at least twice a month; fifty-one per cent. of the members to form a quorum. All resolutions shall be decided by a majority of votes. Where the number of votes is the same on each side, the

President shall have the casting vote, even though he may have already voted *in pro* or *in contra*. The work of the committee must be completed within six months, but this period may be extended at the discretion of the Government. The salary of the President of the committee is fixed at \$5,000 a month, and that of each member at \$1,500 a month, payable out of the funds provided by Law 12,311.

The Transandine Railway

Although nearly a year has elapsed since the Argentine Government announced its intention to proceed with the reconstruction of the Transandine Railway, authorising the expenditure of some \$5,614,500 paper for the purpose (THE RAILWAY GAZETTE of February 7, 1936), no active steps have yet been taken towards this end, in spite of the conference in Chile last March. The Argentine Rural Society has now addressed a note to the Minister of Agriculture, Dr. Miguel Ángel Cárcano, asking for his intervention with the Government on behalf of the rebuilding of the railway. The note refers to the anxiety expressed in Chile that through railway communication between the two countries should be restored as soon as possible, a sentiment recently expressed by the President of that republic at the opening of the Agricultural Exhibition at Santiago. He stressed the commercial advantages that would accrue to both countries by the reopening of the line, and particularly to the Argentine cattle trade, which was formerly a lucrative source of revenue to the railway; the quantity of livestock transported by rail from Argentina at one time averaged 100,000 head per annum.

NEW ZEALAND

Railway Place in Dominion Affairs

In an important recent statement, Mr. G. H. Mackley, General Manager of Railways, pointed out that notwithstanding the onset of road competition, railways still retained their place as a great public utility. The ramifications of the department touched all branches of industry. The volume of traffic handled during last year showed that the railways were quickly returning to a condition of satisfactory profit; their revenue always showed sensitive reaction to general trade conditions. The railways had reached a magnitude of operation of from £6,000,000 to £7,000,000, and the amount contributed to the Consolidated Fund was the largest single item of revenue in the budget. Every effort, said Mr. Mackley, had been made to furnish the public with a high standard of service, and it was the business of

the department to see that that standard was maintained and improved.

Boom in Railway Business

Reports from all parts of the Dominion indicate a boom in railway business. The introduction of a five-day week in a very large number of businesses has had a marked effect in adding to week-end passenger traffic. Particularly is this so in regard to race-meetings, for some of which a quite remarkable increase has been experienced. The break from Friday night to Monday morning has enabled large numbers to go much further afield than they could previously, and full advantage has been taken of convenient train services for this purpose.

Over the Labour Day week-end, October 24 to 26, the Railway Department was embarrassed by the extraordinarily heavy demands for accommodation on some of the longer distance excursions and had to shut down on bookings, as rolling-stock was not available to provide all the overflow trains that could have been filled.

Freight traffic is similarly increasing through heavier import and export business of all kinds, and the generally improved tone in business throughout the Dominion. To meet the increased demands every section of the railways is busy. The provision of heavier engines, better through connections, bridge strengthening, curve and grade reduction, and more rolling stock for both passengers and freight are among the works necessitated by the improved traffic position.

Deviation Finance

A proposed deviation of the Wellington-New Plymouth main line, between Turakina and Ōkoia, is expected to save the Government £4,100 yearly in working costs. It will shorten the route by 2½ miles, will provide a better grade at a lower level, and will absorb 55 per cent. of the cost in labour charges. The total cost is to be £500,000. The job will provide work for about 400 men for at least 2½ years; £250,000 is to be provided from the Employment Promotion Fund.

40-Hour Week for Railwaymen

The Minister of Railways has announced that additional officers were to be appointed to the railway service in order that the 40-hour week system should become operative throughout the department. He also said he was pleased that it had been possible to extend the principle of the five-day week to the head office staff in the first instance, and it would be extended wherever possible. That would mean that the staff might enjoy the full benefit of the 40-hour week so far as it was practicable, having regard to the nature of the industry.

Cadets numbering 264 had been offered positions, and 109 had already been appointed. It was interesting to find that, owing to the general improvement in industry, 65 of the 264

had already been placed in suitable positions, and had therefore declined the offer of appointment in the department. The Minister said that quite a number of suitable members of the staff possessing the necessary qualifications in the second division were also receiving appointments in the first division. The Minister said he could give an assurance from his own knowledge that both the General Manager and the Assistant General Manager were concerned with the staff administration, and were working exceptionally long hours with a view to seeing that the 40-hour week was made general at the earliest possible moment.

Staff Amenities

A contract has been let for the erection, at the new Wellington station, of a staff garage and social hall. The two-storey building which is to be of reinforced concrete faced with red brick to harmonise with the station, will be of utilitarian design; the ground floor is to be a garage for the motorcars of the head office staff, and the first floor, with a special entrance from Waterloo Quay, will be a spacious hall and library, with, at the back, a committee room, cloak rooms, and a well-appointed kitchen. The new building is to cost approximately £10,000. It will be roofed with mission tiles, and the garage will be provided with sliding doors.

RHODESIA

Increased Traffic at Beira

The Port of Beira has been exceptionally busy during the last few months, culminating in September in the record tonnage ever handled in any one month, when 118,758 tons were landed and shipped. Heavy shipments of maize, in particular, with copper and chrome ore accounted for the high tonnage. For the twelve months ended September 30, the tonnage landed and shipped was 897,515 tons, an increase of 85,167 tons over the previous year. There is little doubt but that the next twelve months will show further high tonnages, owing to the increasing production of chrome ore and copper from the Rhodesian mines. In addition, it is anticipated that early in 1937 the importation of petrol and fuel oil in bulk will begin, causing the diversion of a considerable tonnage of new traffic to Beira, that is at present imported in bulk through Durban for the two Rhodesias. It is also stated that the Government of Southern Rhodesia is considering the possibility of establishing cold storage facilities at Beira, to enable the colony to export chilled meat, fruit, &c., by this route instead of via Cape Town.

Cloudburst Causes Washaways

Unusually heavy rains were experienced during November in parts of Southern Rhodesia, particularly in

Bulawayo and the rest of Matabeleland. No serious consequences were felt on the main line, but a cloudburst on the night of November 22 caused two bad washaways near Shabani, on the branch line from Somabula serving that point. At a six-arch culvert spanning a small stream, the water rose rapidly and during the night swept away the eight feet of earth embankment between the top of the culvert and the sleepers, leaving about 50 yd. of track suspended in the air; on each side of the culvert also the line was washed out for a further 50 yd. At another point, about 500 yd. of line was torn up and the soil washed out from under the sleepers. This branch has only two trains each way weekly, and arrangements were made to convey passengers and mails to Shabani by road from a siding on the other side of the washaways. The through train service was resumed on the fifth day after the flood.

Level Crossing Accidents

In Southern Rhodesia, as in other parts of the world, the problem of level crossing protection is receiving much attention. At Salisbury, where there are numerous crossings, and where several accidents have occurred in recent years, agreement has been reached between the City Council and the Rhodesia Railways for the elimination of the crossings on the eastern approaches to the city, and the deviation of certain roads. Some of these works will be consequent upon the re-modelling of the railway tracks, and improvements to Salisbury station will then be effected. The level crossing elimination schemes are estimated to cost about £26,850, of which the Salisbury City Council has agreed to contribute up to £8,000. In Bulawayo there are certain level crossings bearing heavy motor traffic, protected only by warning notices and illuminated signs, and discussions between the City Council and the railways have taken place recently to consider better protection at the more dangerous crossings, pending schemes for their elimination.

CANADA

New Transportation Commission

The Minister of Transport, Mr. C. D. Howe, in announcing the widening of the scope of the Board of Railway Commissioners to include other forms of transport, and its new designation, the Transportation Commission, explains that the change is unlikely to involve any great change in or enlargement of personnel. The new board will be responsible for all transport facilities under the jurisdiction of the Government—instead of only for railways and certain telephone concerns—in so far as freight and passenger rates and fares, accidents, and level crossing questions are concerned. The principal additional charges will be in connection with

inland and coastwise shipping rates. The actual change is unlikely to take place for some weeks to come.

UNITED STATES

Future Freight Rates in Doubt

The "emergency" supplemental freight rates which have added some £20,000,000 annually to railway revenues during the past two years expire on December 31. The railways hope to be permitted to make a general readjustment in freight rates which may retain some part of this added revenue when the supplemental rates expire. Hearings on the proposed new rate basis will begin before the Interstate Commerce Commission on January 6. Meanwhile the railways have petitioned that body to continue the "emergency" rates in effect until a decision is reached in the new case. The National Industrial Traffic League—representing the traffic departments of the larger industrial companies—is opposing both the extension of the supplemental charges and the new proposal with respect to basic rates.

Six-Hour-Day Threat

From the satisfactory returns [recorded in our first Overseas paragraph last week—Ed. R.G.] one might expect that the railways could look forward confidently to a period of comparative prosperity—and so they might, were not political difficulties in their way. Principal among these is the threat of the railway unions to press for legislation in the next Congress limiting railway work to six hours a day, with no decrease in wages. The excuse for this demand is that railway employment has not increased proportionally to railway traffic, and so the unions want to make jobs for more railwaymen.

Railway economists are of the opinion that the six-hour day would prove a boomerang on the unions as an employment measure—because the increase in per-hour wage costs (33½ per cent.), which it would entail, would undoubtedly require the elimination of many "marginal" trains, stations, workshops and branch lines which are, at present wage rates, barely breaking even. But whatever the effect on railway employment, the measure, if enacted, could not be otherwise than ruinous to the railway industry. Its cost is variously estimated at from £60,000,000 to £120,000,000; the latter figure is within £60,000,000 of the net income earned by the railways even in the boom year of 1929.

The Threat of State Ownership

Dr. Virgil Jordan, head of the National Industrial Conference Board, and one of America's best-known economists, has definitely predicted that expensive labour legislation will be enacted by the coming Congress—whether precisely the six-hour day or

not—and that as a result, many indispensable railway lines will not be able to secure capital in the private market; hence the Government will be forced to take them over. Roger Babson, the forecaster of economic developments, has made a similar prediction.

Such predictions, however, are not significant in view of the fact that President Roosevelt has not spoken. He is known to be favourable to shorter hours and higher wages for industrial workers generally, but whether he would consent to the establishment of a six-hour day on the railways, when road hauliers are working their men in some cases more than 12 hours, is not known. If his efforts to improve wages and working conditions are confined to the underprivileged, they will do the railways no harm, but certainly any expensive amelioration in railway conditions from which their competitors were exempted would prove completely ruinous.

Meantime, re-employment by the railways is progressing, nearly 200,000 employees having been restored to the payrolls since the low point of the depression, but the total is still 500,000 short of the 1,700,000 odd who were in service in 1929.

SOUTH AFRICA

Petrol Rate

The negotiations between the Minister of Railways and the oil companies and motor traders, referred to in my last notes, have been satisfactorily concluded. An official statement issued by the Minister reads as follows: "Thanks to the public-spirited attitude of the motor traders and the oil companies and to the buoyant state of railway revenue, the retail price of petrol will, as from December 7 next, be reduced by margins varying from 1d. at the coast to 5d. on the Witwatersrand." The position in regard to Pretoria, Johannesburg and the Witwatersrand is clear. Petrol today in those districts is 2s. 2d. a gallon. On December 7 the price will be reduced by 5d. making it 1s. 9d. a gallon. This is made up by the sacrifice of 3d. a gallon on railway rates, 1d. by the oil companies and 1d. by the retailers.

No Treasury Announcement Yet

The railway rate to other inland centres varies proportionately and the Minister, in consultation with the motor trade representatives, will frame a list which will aim at adjusting the railway rate so as to give the public the maximum benefit of the reduction. It will be realised that as fractions of pennies will have to be taken into consideration, the framing of the list will have to be done in such a manner as to provide the fairest distribution of the benefit of the reduction to the various towns and villages.

While the Treasury has not indi-

cated officially yet that it intends to sacrifice 1d. in Customs dues on petrol during the next financial year, it is understood that this will be done. This will give a further reduction of 1d. a gallon all over the country from April 1 next. When the Treasury reduction of one penny a gallon on Customs dues is made, the total amount involved in the reduction will be £2,500,000. The motor trade representatives who have been conducting the negotiations with the Minister have expressed their appreciation of the manner in which the Government has dealt with the matter.

Further Train Service Accelerations

During the past year the South African Railways and Harbours administration has made several announcements regarding accelerated services that have been duly recorded in THE RAILWAY GAZETTE. Now it is noteworthy that the following further accelerations came into operation on December 1:—

	Trains a week	Acceleration Hr. min.
Natal-Cape Limited ...	1	1 10
Cape Town-Port Elizabeth ...	4	1 20
Port Elizabeth - Cape Town ...	4	0 47
Johannesburg - Port Elizabeth ...	1	0 50
Bulawayo - Cape Town (December 14 to February 1) ...	1	3 17

INDIA

Door-to-Door Goods Service in Calcutta

Arrangements have been made for the delivery of goods arriving at Howrah by the East Indian Railway, on and after December 1, to the place of business or residence in Calcutta of the consignee. There is already a Calcutta street delivery service for parcels, but this service applies only to consignments not exceeding two maunds (about 164½ lb.) in weight. Under the new goods delivery service, a consignment is limited to 40½ maunds (or about 1½ tons) and any one package will be restricted to five maunds. A limit of 75 cu. ft. is prescribed for bulky goods. A corresponding service for the collection of goods for despatch from Howrah by the East Indian Railway will also be inaugurated from December 1. The Calcutta resident or business man has now to put up with considerable inconvenience and waste of time in taking delivery of and despatching goods at Howrah Station, and lorry operators have not failed to seize upon this weakness in railway transport. The competing goods services by road between Calcutta and up-country stations along the Grand Trunk Road and its offshoots have also been steadily growing for some time. The innovation of the East Indian Railway for the collection and delivery of goods carried or to be

carried by rail between Calcutta and Howrah will be greatly appreciated by the public. The railway has in contemplation the development of corresponding services in important towns throughout its system, with the ultimate object of providing door-to-door service for goods transport by rail.

SWEDEN

Railway Revenues

The latest reports from the State Railways, Post Office, and Telegraph and Telephone Department show continued increases of revenues. The State Railways, not including the Lapid iron ore section, during the three quarters January - September, report total revenues of 139.8 million Kr. (£7,689,800 at par) against 132.9 millions for the corresponding period of 1935. The Luleå-Riksgrensens iron ore line for the same period had revenues of 16.4 million Kr. (£902,100 at par) against 12.3 millions in 1935.

THE FAR EAST

Private Indo-China Line Absorbed

The metre-gauge railway from Pnom-Penh to Mongkolkevy in the province of Cambodge, has been incorporated in the Indo-Chinese State Railways. It is an isolated section 200 miles long, and is connected to the State lines at Mytho by a steamer service on the River Mekong.

Hong Kong Airways Junction

After prolonged negotiations, it has been decided to make Hong Kong the terminus for the Pan American Airways trans-Pacific line. As the China National Aviation Corporation is also to use Hong Kong instead of Macao, and as the colony is the Far Eastern terminus of Imperial Airways, this air port is likely to become the largest airways junction in the Far East.

Chengtu-Chungking Construction

The Chengtu-Chungking Railway construction [which as previously mentioned is to be carried out along a new alignment resulting from re-survey, and to be assisted with French capital.—Ed. R.G.] seems likely to be pushed ahead at once. It is also announced that the extent of the French loan in material and cash is about £2,160,000, redeemable in 15 years and guaranteed unconditionally by the Ministry of Railways in Nanking. A new company formed to provide the balance of the capital required—about half as much again as the loan—will also work the new line. The distance between the Szechwan capital, Chengtu, and the City of Chungking, on the Yangtze, is about 325 miles, and the line will tap some of the richest areas in Szechwan, a province noted for its mineral wealth.

RAILWAY PERSONALITIES OF 1837

(From a correspondent)

AMONG the many railway personalities that came into prominence a hundred years ago, two names are outstanding, namely, Edmondson and Rowland Hill. It was in 1837 that Thomas Edmondson invented printed railway tickets, when, as a railway clerk on the Newcastle & Carlisle Railway he found that writing each ticket individually was hard work, and conceived the idea of printing tickets, from which developed the Railway Clearing House; he was also the inventor of the checking machine and the dating press. The same year was also that in which the great Sir Rowland Hill propounded his scheme of penny postage. His outstanding work in this connection has overshadowed his railway career, but it is worthy of record that in 1845 he became Chairman of the London & Brighton Railway Company (itself a formation of 1837), and was instrumental in introducing the system of cheap excursions and express trains.

John Rastrick became a Fellow of the Royal Society in 1837, and with Sir John Rennie carried the direct Brighton line, against several competitors. Towards the end of the year Rastrick began actively superintending the construction of the main line and the branch to Shoreham, and the heavy works, including Merstham, Balcombe, and Clayton tunnels, and the Ouse viaduct of 37 arches at an elevation of a hundred feet, were all completed by the autumn of 1840. The famous civil engineer, Edward Woods, reported to the British Association in 1837 on the resistance of railway trains; Herbert Spencer, the great philosopher, became engineer on the Birmingham & Gloucester Railway; William John Hamilton, the geologist and railway director, became President of the Royal Geographical Society; William Froude, a famous engineer, joined the staff of Isambard Kingdom Brunel on the Bristol & Exeter Railway; and Dumont d'Urville, a famous French admiral (who was killed in a railway accident in 1842) began a voyage of Antarctic exploration.

John Pitt Kennedy became in 1837 Inspector-General under the Irish National Education Department. He was later appointed Consulting Engineer for Railways to the Government of India. He opposed any break of gauge, and laid plans for a system throughout India. Kennedy became founder and Managing Director of the Bombay, Baroda & Central India Railway, and went out to India again to survey the line. At the general election of 1837 Sir Henry George Ward, "father of railways in Ceylon," was returned for Sheffield; and Lord Ramsay for Haddingtonshire. Ramsay was later, as the Marquis of Dalhousie, one of the greatest of Indian Viceroy, and instituted great railway schemes in India. Before his appointment as Viceroy he had succeeded Gladstone as President of the Board of Trade, and when Peel resigned, in 1846, Lord John Russell asked Dalhousie to remain to carry out the regulations he had framed for the railway system. He had thus immense influence in the development of the railway system in England in the 'forties.

On the last day of 1837 was born George Henry Turner, Chairman of the Railway Benevolent Institution, and President of the General Managers' Conference of Railways in Great Britain. In his early career he was clerk at the Bristol & Exeter Railway station at Bridgwater, and became goods clerk under the Midland Railway at Bristol, and chief goods clerk at Birmingham. In 1875 he was appointed chief goods agent at Nottingham, in 1878 chief goods canvasser at Derby, and in 1885 Goods Manager of the Glasgow & South Western Railway. In

1887 he returned to the Midland Railway as Chief Goods Manager, and in 1891 was Assistant General Manager, and soon afterwards General Manager.

March 18 is the centenary of the birth of Grover Cleveland, Democrat President of the United States, who, in his second term of office, was called upon to deal with the great railway strike of June/July, 1894. John Pierpont Morgan, the great American financier, was a month younger than Cleveland. He helped to restore financial stability in the United States after the panic of 1893, and was principal negotiator of bond issues of the Cleveland administration. Morgan was prominent in reorganisation of railroads; as was Charles Tyson Yerkes, another great American financier born in 1837. Yerkes was connected with elevated railway operations in Philadelphia and Chicago, and was famous as the donor of the finest telescope in the world to the observatory named after him. Yerkes has a particular claim on the interest of Londoners, for he was the driving force of the American group that secured control of the District Railway and electrified it; built the nucleus of the London tube system; and in the Underground Electric Railways Co. of London Ltd. laid the foundations of the traffic co-ordination plans which eventuated in the formation of the London Passenger Transport Board.

Yet another famous American connected with railroad enterprises who was born in 1837 was General Horace Porter. He was General Ulysses S. Grant's colleague in the Civil War, after which he turned to his business career. An interesting celebrity born in 1837 (on September 21) was John Ellor Taylor, journalist and science writer. He began life as storeboy at the L.N.W.R. locomotive works at Longsight, and was for a time in the engineer draughtsmen's office at the Crewe works. It was the encouragement of the foreman at Longsight that made him begin to study the classics and natural sciences. Another celebrity on the practical side born in 1837 was Frank M'Clean, F.R.S., who was apprenticed to Sir John Hawkshaw in 1859, and was until 1870 in charge of important dock and railway works, becoming subsequently famous as an astronomer.

Among famous politicians connected with railways who were born in 1837 were: Michael Arthur Bass, first Baron Burton (November 12), head of the famous brewery firm, and a director of the South Eastern Railway Company; Lord Stalbridge (January 28), Chief Liberal Whip, and Chairman of the London and North Western Railway; Sir William Hart-Dyke (August 7), Chief Secretary for Ireland, and Chairman of the London, Chatham and Dover Railway; Charles Townsend Murdoch, M.P., for Reading, and Director of the Great Western Railway; and the Right Hon. John Lloyd Wharton (April 18), M.P. for Ripon, and Chairman of the North Eastern Railway Company.

There were also born in 1837 Sir Charles Bradley Pritchard (May 5), an Anglo-Indian administrator who developed railways as Commissioner of Sind; Thomas Henry Ismay (January 7), a founder of the White Star Line, and also a Director of the London and North Western Railway Company; Sir Francis Mowatt (April 27), Permanent Secretary to the Treasury, and a railway director; and Sir Robert Giffen, F.R.S. (July 22), the famous statistician, President of the Statistical Society, and advocate of a tunnel under the Irish Sea. His publications included "American Railways as Investments."

ASPECTS OF PERMANENT WAY MAINTENANCE

The annual statutory returns of the British main line railways reveal interesting facts concerning the material and financial aspects of permanent way maintenance

FROM the annual British railway statistics issued by the Ministry of Transport, the following analytical notes dealing with certain aspects of permanent way maintenance have been prepared. Details of expenditure in Abstract A are separated under the two main heads of Renewal of Running Lines, and Repair of Running Lines and Sidings. These heads are themselves subdivided to record the sums spent upon wages, materials, and engine power; the mileage of track renewed is also included. Particulars are given in Statistical Return X of mileage maintained, and of rails, sleepers, and ballast used. Train-miles run in relation to expenditure are shown in Return XII B.

The different traffic densities of the four railways, expressed in train-miles per track-mile per annum, are set out in Table I herewith. It appears from this table that the mean traffic density over the past 13 years on the L.M.S.R., L.N.E.R., G.W.R., and Southern Railway, works out at 7,640, 6,420, 7,200 and 10,870 respectively;

if the year 1926, in which occurred the general and railway strikes, is excluded, the variation from the mean in the first three cases is small, namely, L.M.S.R. -3 to +5 per cent., L.N.E.R. -1½ to +8, and G.W.R. -1½ to +6½ per cent., but on the Southern it is from -15 to +16 per cent.; in fact there has been a steady increase on the Southern from 9,230 to 12,600, or 36½ per cent. in 13 years.

Although all four companies now use very similar types of material, the actual unit net cost of such material is likely to be influenced by their geographical positions; not only must the cost of carriage be allowed for in the case of companies remote from the makers' works, but the net cost, which presumably allows for the value of old material displaced, is more favourable in the case of companies conveniently situated for supplying purchasers. It is therefore proposed to examine first the user of material on a quantitative basis, as more likely to be reliable than the financial basis, which will be dealt with later.

TABLE I

L.M.S.R.								L.N.E.R.							
Year	Track Miles Maintained, Including Sidings	Train Miles (Millions)*					Train Miles* per Track Mile		Track Miles Maintained, Including Sidings	Train Miles (Millions)*					Train Miles* per Track Mile
		Coaching	Per cent.	Goods	Per cent.	Total				Coaching	Per cent.	Goods	Per cent.	Total	
1923	19,112	86.8	59	59.9	41	146.7	7,670		16,539	58.1	56	46.4	44	104.5	6,320
24	19,175	88.3	59	60.7	41	149.0	7,770		16,618	58.7	56	46.1	44	104.8	6,320
25	19,185	89.2	60	59.8	40	149.0	7,760		16,647	60.1	57	45.0	43	105.1	6,320
26	19,205	76.0	61	48.7	39	124.7	6,500		16,665	52.8	60	35.1	40	87.9	5,270
27	19,250	89.5	59	61.5	41	151.0	7,850		16,245	60.3	57	46.0	43	106.3	6,550
28	19,296	91.7	61	59.2	39	150.9	7,820		16,248	62.6	58	44.7	42	107.3	6,610
29	19,136	92.5	61	60.0	39	152.5	7,970		16,224	64.7	57	47.3	43	112.0	6,910
1930	19,186	92.0	61	57.6	39	149.6	7,800		16,223	64.4	58	45.9	42	110.3	6,800
31	19,205	90.4	62	54.2	38	144.6	7,530		16,264	62.6	59	42.6	41	105.2	6,480
32	19,195	90.7	64	51.4	36	142.1	7,410		16,262	62.9	61	39.3	39	102.2	6,290
33	19,193	92.7	64	50.9	36	143.6	7,480		16,321	63.8	62	39.4	38	103.2	6,330
34	19,182	97.0	64	53.5	36	150.5	7,850		16,302	65.9	61	42.2	39	108.1	6,630
35	19,157	99.5	65	53.9	35	153.4	8,010		16,306	67.3	61	42.3	39	109.6	6,720
							7,640	Mean							6,420
G.W.R.								S.R.							
1923	8,730	37.5	60	25.2	40	62.7	7,180		5,301	42.0	87	6.9	13	48.9	9,230
24	8,780	38.0	60	25.3	40	63.3	7,210		5,315	42.7	86	7.1	14	49.8	9,370
25	8,952	38.2	61	24.4	39	62.6	7,000		5,353	45.2	86	7.3	14	52.5	9,820
26	8,970	34.4	64	19.3	36	53.7	5,990		5,342	42.8	87	6.3	13	49.1	9,200
27	8,873	38.9	61	24.8	39	63.8	7,200		5,333	47.7	87	7.2	13	54.9	10,300
28	8,495	40.0	62	24.1	38	64.1	7,550		5,335	49.9	88	7.1	12	57.0	10,680
29	8,527	40.4	62	25.0	38	65.4	7,670		5,343	52.1	88	7.3	12	59.4	11,120
1930	8,554	40.7	63	24.3	37	65.0	7,600		5,353	53.9	88	7.3	12	61.2	11,440
31	8,585	39.6	63	22.9	37	62.5	7,280		5,332	54.7	88	7.2	12	61.9	11,600
32	8,618	39.4	64	22.0	36	61.4	7,130		5,334	54.6	89	7.1	11	61.7	11,560
33	8,665	39.6	64	21.9	36	61.5	7,100		5,333	57.6	89	7.1	11	64.7	12,140
34	8,666	40.7	64	22.7	36	63.4	7,320		5,316	58.2	89	7.4	11	65.6	12,340
35	8,675	42.1	65	22.7	35	64.8	7,480		5,298	59.5	89	7.3	11	66.8	12,600
							7,200	Mean							10,870

* Exclusive of shunting miles.

TABLE III.—RAILS

Year	L.M.S.R.			L.N.E.R.			G.W.R.			S.R.		
	Rails Used, Tons	Train Miles Per Ton of Rails Used	Rails Used, Tons	Rails Used, Tons	Train Miles Per Ton of Rails Used	Rails Used, Tons	Rails Used, Tons	Train Miles Per Ton of Rails Used	Rails Used, Tons	Rails Used, Tons	Train Miles Per Ton of Rails Used	Rails Used, Tons
1923	72,047	2,040	61,901	1,680	33,516	1,870	28,114	1,740	72,032	2,070	62,307	1,680
24	72,032	2,070	62,307	1,680	33,516	1,870	28,114	1,740	78,056	1,910	61,546	1,680
25	78,056	1,910	61,546	1,680	33,516	1,870	28,114	1,740	80,703	1,550	44,889	1,960
26	80,703	1,550	44,889	1,960	27,712	1,940	23,498	2,090	78,025	1,920	54,003	1,970
27	78,025	1,920	54,003	1,970	29,241	2,180	36,280	1,510	78,757	1,920	34,421	1,870
28	78,757	1,920	34,421	1,870	32,270	1,870	32,100	1,770	89,441	1,710	52,509	1,810
29	89,441	1,710	52,509	1,810	36,007	1,810	31,422	1,890	93,094	1,610	47,035	2,350
1930	93,094	1,610	47,035	2,350	38,039	1,710	30,871	1,980	94,376	1,530	41,492	1,680
31	94,376	1,530	41,492	1,680	37,089	1,680	29,414	2,100	90,640	1,570	32,702	1,680
32	90,640	1,570	32,702	1,680	36,594	1,680	29,163	2,110	85,772	1,670	31,276	2,000
33	85,772	1,670	31,276	2,000	29,242	2,000	22,578	2,860	87,014	1,730	37,172	2,090
34	87,014	1,730	37,172	2,090	30,364	2,090	28,529	2,300	89,576	1,710	43,437	2,580
35	89,576	1,710	43,437	2,580	31,643	2,050	27,489	2,430	—	—	—	—
Mean	—	1,750	—	2,190	—	1,870	—	1,970	—	—	—	—

TABLE V.—BALLAST

Year	L.M.S.R.		L.N.E.R.		G.W.R.		S.R.	
	Total	Per Track Mile	Total	Per Track Mile	Total	Per Track Mile	Total	Per Track Mile
1923	421,997	22	626,541	38	371,102	42	186,114	35
24	461,508	25	658,143	40	368,874	42	157,288	30
25	489,489	24	679,692	41	436,594	49	166,487	31
26	391,831	20	497,408	30	300,540	34	78,686	15
27	489,165	25	562,290	35	383,107	43	169,693	32
28	467,134	24	613,123	38	449,102	53	283,281	53
29	551,719	29	583,176	36	391,801	46	316,590	59
1930	593,900	31	526,334	32	367,240	43	316,590	59
31	600,051	31	504,250	31	366,724	43	340,665	64
32	735,603	38	421,267	26	352,745	41	247,093	46
33	676,722	35	461,127	28	332,920	38	238,443	45
34	702,371	37	483,669	30	319,384	37	272,221	51
35	595,075	31	477,056	29	347,043	40	302,050	57
Mean	—	29	—	33	—	42	—	45

TABLE II.—COMPLETE RENEWAL OF RUNNING LINES

Year	L.M.S.R.			L.N.E.R.			G.W.R.			S.R.		
	Track Miles Renewed	Life Basis, Years	Train Miles per 1000's	Track Miles Renewed	Life Basis, Years	Train Miles per 1000's	Track Miles Renewed	Life Basis, Years	Train Miles per 1000's	Track Miles Renewed	Life Basis, Years	Train Miles per 1000's
1923	346	38	424	272	42	384	185	34	338	151	27	324
24	375	35	397	318	36	330	186	34	340	165	25	302
25	431	31	346	300	38	350	208	31	301	177	32	297
26	440	30	283	236	48	372	167	38	321	129	33	280
27	431	31	346	299	38	355	197	21	296	176	23	279
28	457	29	330	290	39	370	261	23	246	197	23	324
29	529	25	288	272	41	412	266	20	246	204	20	291
1930	555	24	270	248	45	445	326	19	199	188	22	325
31	581	23	249	212	53	496	334	18	187	189	22	327
32	525	25	271	176	64	581	314	20	195	176	23	350
33	522	26	275	192	59	538	252	25	244	144	29	449
34	531	25	283	225	50	481	266	23	238	175	23	374
35	534	25	288	254	44	432	271	23	239	169	24	395
Mean	481	28	305	253	45	415	250	26	250	172	24	336

TABLE IV.—SLEEPERS

Year	L.M.S.R.			L.N.E.R.			G.W.R.			S.R.		
	Sleepers Used (1)	Per Track Mile (2)	Train Miles per 100 Sleepers Used (3)	Sleepers Used (1)	Per Track Mile (2)	Train Miles per 100 Sleepers Used (3)	Sleepers Used (1)	Per Track Mile (2)	Train Miles per 100 Sleepers Used (3)	Sleepers Used (1)	Per Track Mile (2)	Train Miles per 100 Sleepers Used (3)
1923	1,092,510	57	13,500	1,264,162	77	8,300	656,181	75	9,600	483,301	91	10,100
24	1,115,143	58	13,400	1,103,754	68	9,400	808,656	92	7,800	618,454	116	8,100
25	1,290,739	67	11,500	1,296,338	78	8,100	881,172	98	7,100	711,240	132	7,400
26	1,303,758	68	9,600	934,321	56	9,400	644,700	72	8,300	518,283	97	9,500
27	1,360,680	71	11,100	1,339,339	82	7,900	706,995	79	9,000	742,690	139	7,800
28	1,487,628	78	10,100	1,456,961	90	7,400	749,013	88	8,600	700,468	131	8,100
29	1,548,509	81	9,800	1,407,824	87	8,000	828,964	97	7,900	686,103	129	8,700
1930	1,539,058	80	9,700	1,178,823	73	9,400	844,494	99	7,700	611,179	114	10,000
31	1,540,784	80	9,400	1,173,395	72	9,000	842,889	98	7,500	612,458	115	10,100
32	1,465,792	76	9,700	929,973	57	11,000	762,393	88	8,100	583,089	109	10,600
33	1,337,227	70	10,700	895,150	55	11,500	620,833	72	9,900	575,725	108	11,200
34	1,494,757	78	10,100	1,034,357	63	10,500	622,910	72	10,100	649,662	122	10,100
35	1,573,219	82	9,800	1,123,268	69	9,800	670,585	77	9,700	604,721	104	11,000
Mean	—	73	10,500	—	71	9,000	—	85	8,400	—	116	9,300

Complete Renewal of Running Lines

In Table II will be found particulars of the length of track renewed each year. Column (2) is obtained by dividing the miles renewed into the mileage of running line, thus producing a life basis *in time*, while Column (3) has been derived by dividing track-miles renewed into train-miles run, thus giving a life basis *in trains*. The table suggests that the factor governing complete renewal is age in years rather than traffic carried, and with an average life of 28, 26 and 24 years on the L.M.S.R., G.W.R., and Southern respectively, there is a fair measure of consistency. A satisfactory standard of maintenance combined with a 45-year life on the L.N.E.R. can be ascribed to a heavy programme of re-conditioning in preference to more extensive renewals; this company's traffic density is considerably below that of other railways.

Except on the L.N.E.R. the policy has been to renew on a shorter life basis during the past seven years, as will be seen from the following:—

LIFE BASIS IN YEARS		
Period	L.M.S.R.	L.N.E.R.
1923-28 ..	32	40
1929-35 ..	25	51
G.W.R. S.R.		
1923-28 ...	31½	25
1929-35 ..	22	23

The mean life in trains between successive renewals on all four railways works out at 324,000 trains; the results on the L.M.S.R. and Southern approximate closely to this figure, but there is a tendency towards a reduction in train-life on the L.M.S.R., and an increase on the Southern. The L.N.E.R. train-life of track is 66 per cent. higher than the G.W.R. and 23 per cent. above that on the intensely loaded Southern.

Rails

Except where corrosion plays a part, as in tunnels, the governing factor in rail life must be the traffic density; Table III has been prepared on this assumption, and shows the tonnage of rails used according to Statistical Return X, and the train-miles run per ton of rails used. The mean figures of the four companies for the thirteen years show that on the average

TABLE VI.

EXPENDITURE ON UPKEEP OF PERMANENT WAY—RENEWALS AND REPAIRS

Year	L.M.S.R.						L.N.E.R.					
	Per Track Mile			Per Train Mile			Per Track Mile			Per Train Mile		
	Renewals	Repairs	Total	Renewals	Repairs	Total	Renewals	Repairs	Total	Renewals	Repairs	Total
1923	£ 64	£ 199	£ 263	d. 2.01	d. 6.22	d. 8.23	£ 55	£ 178	£ 233	d. 2.10	d. 6.74	d. 8.84
24	58	185	243	1.80	5.70	7.50	49	167	216	1.85	6.35	8.20
25	69	184	253	2.14	5.69	7.83	52	174	226	1.96	6.60	8.56
26	66	166	232	2.43	6.14	8.57	41	141	182	1.89	6.42	8.31
27	62	174	236	1.90	5.33	7.23	51	163	214	1.88	5.97	7.85
28	64	176	240	1.96	5.41	7.37	48	172	220	1.75	6.25	8.00
29	68	172	240	2.04	5.18	7.22	43	164	207	1.51	5.70	7.21
1930	74	164	238	2.27	5.06	7.33	40	156	196	1.42	5.49	6.91
31	77	152	229	2.47	4.85	7.32	34	154	188	1.27	5.73	7.00
32	67	152	219	2.16	4.92	7.08	29	135	164	1.12	5.15	6.27
33	65	142	207	2.07	4.54	6.61	27	124	151	1.04	4.72	5.76
34	60	146	206	1.84	4.48	6.32	31	124	155	1.12	4.49	5.61
35	65	141	206	1.96	4.22	6.18	36	126	162	1.28	4.51	5.79
Mean	66	166	232	2.08	5.21	7.29	41	152	193	1.55	5.71	7.26
Percentage Expenditure Compared with Year 1923												
1923	100	100	100	100	100	100	100	100	100	100	100	100
24	91	93	92	90	92	91	89	94	93	88	94	93
25	108	92	96	106	92	95	95	98	97	93	98	97
26	103	83	88	121	99	104	75	79	78	90	95	94
27	97	87	90	95	86	88	93	92	92	90	89	89
28	100	88	91	98	87	90	87	97	94	83	93	90
29	106	86	91	102	83	88	78	92	89	72	85	82
1930	116	82	90	113	81	89	73	88	84	68	81	78
31	120	76	87	123	78	89	62	87	81	61	85	79
32	105	76	83	107	79	86	53	76	70	53	76	71
33	102	71	79	103	73	80	49	70	65	50	70	65
34	94	73	78	92	72	77	56	70	66	53	67	63
35	102	71	78	98	68	75	65	71	70	61	67	65
G.W.R. S.R.												
1923	£ 84	£ 217	£ 301	d. 2.80	d. 7.25	d. 10.05	£ 99	£ 228	£ 327	d. 2.59	d. 5.94	d. 8.53
24	74	214	288	2.48	7.13	9.61	108	217	325	3.02	5.57	8.59
25	68	227	295	2.32	7.81	10.13	125	240	365	3.05	5.86	8.91
26	51	177	228	2.04	7.11	9.15	80	194	274	2.08	5.06	7.14
27	64	178	242	2.13	5.95	8.08	120	232	352	2.80	5.42	8.22
28	80	181	261	2.53	5.74	8.27	112	256	368	2.51	5.74	8.25
29	80	176	256	2.49	5.50	7.99	120	243	363	2.59	5.24	7.83
1930	96	154	250	3.04	4.86	7.90	110	229	339	2.32	4.80	7.12
31	93	149	242	3.06	4.90	7.96	106	219	325	2.18	4.54	6.72
32	89	141	230	3.01	4.76	7.77	95	198	293	1.98	4.11	6.09
33	71	133	204	2.40	4.52	6.92	78	199	277	1.54	3.94	5.48
34	68	127	195	2.23	4.17	6.40	95	212	307	1.85	4.12	5.97
35	69	129	198	2.23	4.15	6.38	92	225	317	1.75	4.30	6.05
Mean	76	169	245	2.52	5.68	8.20	103	222	325	2.33	4.97	7.30
Percentage Expenditure Compared with Year 1923												
1923	100	100	100	100	100	100	100	100	100	100	100	100
24	88	99	96	89	98	96	108	95	99	116	94	101
25	81	106	98	83	108	101	125	105	112	118	99	104
26	61	82	76	73	98	91	80	85	84	80	85	84
27	75	82	80	76	82	80	120	102	108	108	91	96
28	95	83	87	90	79	82	112	112	112	97	97	97
29	95	81	85	89	76	80	120	107	111	100	88	92
1930	114	71	83	108	67	79	110	100	104	90	81	83
31	111	69	80	109	68	79	106	96	99	84	76	79
32	106	65	76	107	66	77	95	87	90	76	69	71
33	85	61	68	86	62	69	78	87	85	59	66	64
34	81	59	65	80	58	64	95	93	94	71	69	70
35	82	59	66	80	57	64	92	99	97	68	72	71

TABLE VII.

EXPENDITURE ON PERMANENT-WAY MATERIALS—RENEWALS AND REPAIRS

Year	L.M.S.R.						L.N.E.R.					
	Per Track Mile			Per Train Mile			Per Track Mile			Per Train Mile		
	Renewals	Repairs	Total	Renewals	Repairs	Total	Renewals	Repairs	Total	Renewals	Repairs	Total
1923	£ 46	£ 47	£ 93	d. 1.43	d. 1.40	d. 2.83	£ 39	£ 41	£ 80	d. 1.48	d. 1.56	d. 3.04
24	40	34	74	1.23	1.06	2.29	31	35	66	1.18	1.32	2.50
25	48	35	83	1.48	1.09	2.57	35	41	76	1.33	1.57	2.90
26	47	38	85	1.69	1.41	3.10	27	30	57	1.23	1.38	2.61
27	41	33	74	1.26	1.02	2.28	32	39	71	1.19	1.43	2.62
28	44	36	80	1.37	1.11	2.48	31	47	78	1.11	1.69	2.80
29	46	35	81	1.38	1.05	2.43	27	44	71	0.94	1.52	2.46
1930	51	34	85	1.57	1.06	2.63	26	38	64	0.90	1.34	2.24
31	57	36	93	1.80	1.16	2.96	23	44	67	0.85	1.64	2.49
32	49	38	87	1.59	1.25	2.84	20	33	53	0.75	1.28	2.03
33	46	32	78	1.48	1.01	2.49	19	27	46	0.72	1.03	1.75
34	42	34	76	1.29	1.03	2.32	21	26	47	0.77	0.93	1.70
35	46	30	76	1.39	0.90	2.29	25	29	54	0.89	1.03	1.92
Mean	46	36	82	1.46	1.12	2.58	27	37	64	1.03	1.36	2.39

Percentage Expenditure Compared with Year 1923

1923	100	100	100	100	100	100	100	100	100	100	100	100
24	87	72	80	86	76	81	80	85	83	80	85	82
25	104	74	89	103	78	91	90	100	95	90	101	95
26	102	81	91	118	100	109	69	73	72	83	88	86
27	89	70	80	88	73	80	82	95	89	80	92	86
28	96	77	86	96	79	88	80	115	98	75	108	92
29	100	74	87	96	75	86	69	107	89	64	97	81
1930	111	72	91	110	76	93	67	93	80	61	66	74
31	124	77	100	126	83	105	59	107	84	57	105	82
32	106	81	94	111	89	100	51	80	64	51	82	67
33	100	68	84	103	72	88	49	66	58	49	66	58
34	91	72	82	90	74	82	54	63	59	52	60	56
35	100	64	82	97	64	81	64	71	68	60	66	63

Year	G.W.R.						S.R.					
	Per Track Mile			Per Train Mile			Per Track Mile			Per Train Mile		
	Renewals	Repairs	Total	Renewals	Repairs	Total	Renewals	Repairs	Total	Renewals	Repairs	Total
1923	£ 69	£ 57	£ 126	d. 2.30	d. 1.89	d. 4.19	£ 77	£ 55	£ 132	d. 1.99	d. 1.44	d. 3.43
24	58	50	108	1.94	1.68	3.62	91	50	141	2.32	1.28	3.60
25	50	62	112	1.72	2.14	3.86	91	73	164	2.24	1.78	4.02
26	38	44	82	1.54	1.75	3.29	58	47	105	1.52	1.23	2.75
27	46	34	80	1.54	1.14	2.68	89	67	156	2.08	1.56	3.64
28	57	33	90	1.82	1.03	2.85	78	78	156	1.77	1.77	3.54
29	57	37	94	1.79	1.14	2.93	86	70	156	1.86	1.50	3.36
1930	70	24	94	2.21	0.75	2.96	81	62	143	1.70	1.30	3.00
31	69	27	96	2.29	0.87	3.16	79	64	143	1.64	1.33	2.97
32	67	23	90	2.28	0.79	3.07	71	53	124	1.48	1.11	2.59
33	53	21	74	1.79	0.71	2.50	56	60	116	1.11	1.18	2.29
34	50	20	70	1.64	1.65	2.29	69	65	134	1.34	1.26	2.60
35	51	19	70	1.63	0.62	2.25	66	70	136	1.25	1.33	2.58
Mean	56	35	91	1.88	1.17	3.05	76	63	139	1.71	1.39	3.10

Percentage Expenditure Compared with Year 1923

1923	100	100	100	100	100	100	100	100	100	100	100	100
24	84	88	86	84	89	86	117	91	107	116	89	106
25	72	109	89	75	114	92	117	133	124	113	124	119
26	55	77	65	67	93	79	75	85	80	76	85	81
27	67	60	63	67	60	64	116	122	118	105	108	107
28	83	58	71	79	54	68	101	142	118	89	123	104
29	83	65	75	78	60	70	112	127	118	93	104	99
1930	101	42	75	96	40	71	105	113	108	85	90	88
31	100	47	76	100	46	75	103	126	108	82	92	88
32	97	40	71	99	42	73	92	96	94	74	77	76
33	77	37	59	78	38	60	73	109	88	56	82	68
34	72	35	56	71	34	55	90	118	101	67	88	77
35	74	33	56	71	33	54	86	127	103	63	92	76

about 1,945 train-miles are run per ton of rails used. Assuming 95-lb. rails are laid, equivalent to 150 tons per track-mile, the indication is that the average useful life of a 95-lb. rail is $1,945 \times 150$, or say 290,000 trains; it must be remembered, however, that the correctness of this figure depends on the original weight of the rails removed, and not those used to replace them.

The user of rails on a train-mile basis during the first six and last seven years under review are shown in the following table:—

TRAIN MILES PER TON OF RAILS USED			
Period		L.M.S.R.	L.N.E.R.
1923-28	..	1,900	1,820
1929-35	..	1,640	2,630
		G.W.R.	S.R.
1923-28	..	1,890	1,700
1929-35	..	1,860	2,210

Sleepers

Column (2) of Table IV provides a basis for quantitative comparison of sleepers used each year. If resistance to decay were the only influence upon the life of a sleeper, it would naturally be expected that the number used per track-mile each year would be similar on all lines. Except for a close agreement between the L.M.S.R. and L.N.E.R., however, this is not so. There is, however, a fair degree of uniformity between the companies on the basis of train-mile per 100 sleepers used, as shown in Column (3). In the absence of other explanations, it does therefore appear that the wear and tear of traffic is a serious contributing factor in determining the life of sleepers.

Ballast

The use of ballast (Table V) calls for no special comment; a comparative basis is given in the form of cubic yards per track-mile, from which it will be seen that proportionately the G.W.R. and Southern, are heavier users of ballast than the L.M.S.R. and L.N.E.R.

Expenditure

In spite of the reservations with which financial comparisons between the companies must be accepted, some interest attaches to the total costs of track maintenance per track-mile and per train-mile shown in Table VI. Owing to differences in traffic density, varia-

tions in cost per track-mile are to be expected, but the mean costs per train-mile on the L.M.S.R., L.N.E.R. and Southern are almost identical, with the G.W.R. about 12½ per cent. higher. In spite of the similarity of total costs, the proportions of renewals and repairs are by no means the same:—

	Renewals Per cent.	Repairs Per cent.
L.M.S.R. ..	28½	71½
L.N.E.R. ..	21½	78½
G.W.R. ..	30½	69½
S.R. ..	32	68

The figures in the bottom half of Table VI indicate the percentage costs under each head compared with 1923. Total upkeep costs per track-mile have fallen some 20 per cent. on the L.M.S.R. since 1923, and by about 30 and 34 per cent. on the L.N.E.R. and G.W.R. respectively; on the Southern, with its large increase in traffic, the decline per track-mile is only small. On a train-mile basis, however, Southern expenditure is now some 30 per cent. less than 13 years ago; the L.M.S.R. is 25 per cent. and the L.N.E.R. and G.W.R. about 35 per cent. lower. Renewals expenditure on the L.M.S.R., and to a lesser extent on the Southern, has been remarkably constant. Reduced expenditure on the former line has been almost entirely accounted for by savings in repairs; similar reduced repair costs account largely for the smaller expenditure on the L.N.E.R. and G.W.R.

Tables VII and VIII, showing the expenditure on materials and wages respectively, reveal the following mean ratios of wages to materials:—

	Materials	Wages
L.M.S.R. ..	57	100
L.N.E.R. ..	52	100
G.W.R. ..	61	100
S.R. ..	78	100

Since materials plus wages per train-mile are the same in three cases, a diagram has been plotted, with cost per train-mile in respect of Total, Materials, and Wages against traffic density. Except for the G.W.R., the respective points are almost colinear. Although the chart indicates that between wide limits the upkeep cost of track per train-mile is constant, and that wages *decrease* about

TABLE VIII.

WAGES EXPENDITURE ON PERMANENT WAY—RENEWALS AND REPAIRS

Year	L.M.S.R.						L.N.E.R.					
	Per Track Mile			Per Train Mile			Per Track Mile			Per Train Mile		
	Renewals	Repairs	Total	Renewals	Repairs	Total	Renewals	Repairs	Total	Renewals	Repairs	Total
1923	£ 15	£ 146	£ 161	d. 0.48	d. 4.57	d. 5.05	£ 14	£ 132	£ 146	d. 0.53	d. 5.01	d. 5.54
24	15	142	157	0.47	4.40	4.87	15	128	143	0.58	4.89	5.47
25	18	142	160	0.55	4.37	4.92	14	128	142	0.54	4.86	5.40
26	17	122	139	0.63	4.52	5.15	12	107	119	0.54	4.86	5.40
27	18	134	152	0.54	4.10	4.64	15	118	133	0.56	4.33	4.89
28	16	134	150	0.50	4.11	4.61	15	120	135	0.54	4.38	4.92
29	19	131	150	0.56	3.94	4.50	14	116	130	0.49	4.04	4.53
1930	19	124	143	0.59	3.82	4.41	12	114	126	0.43	4.01	4.44
31	17	111	128	0.55	3.53	4.08	10	106	116	0.35	3.95	4.30
32	15	107	122	0.47	3.47	3.94	8	98	106	0.32	3.75	4.06
33	15	105	120	0.47	3.36	3.83	7	94	101	0.26	3.57	3.83
34	15	107	122	0.44	3.29	3.73	8	95	103	0.30	3.45	3.75
35	15	105	120	0.46	3.16	3.62	9	94	103	0.33	3.37	3.70
Mean	16	124	140	0.52	3.89	4.41	12	111	123	0.44	4.19	4.63
Percentage Expenditure Compared with Year 1923												
1923	—	100	100	100	100	100	—	100	100	100	100	100
24	—	97	96	98	96	96	—	97	98	109	98	99
25	—	97	99	115	96	97	—	97	97	102	97	97
26	—	84	86	131	99	102	—	81	82	102	97	97
27	—	92	94	112	90	92	—	89	91	106	86	88
28	—	92	93	104	90	91	—	91	92	102	87	89
29	—	90	93	117	86	89	—	88	89	92	81	82
1930	—	85	89	123	84	87	—	86	86	81	80	80
31	—	76	79	115	77	81	—	80	79	66	79	78
32	—	73	76	98	76	78	—	74	73	60	75	73
33	—	72	75	98	73	76	—	71	69	49	71	69
34	—	73	76	92	72	74	—	72	71	57	69	68
35	—	72	75	96	69	72	—	71	71	62	67	67
Percentage Expenditure Compared with Year 1923												
1923	—	100	100	100	100	100	—	100	100	100	100	100
24	—	102	102	107	102	102	—	97	98	115	95	97
25	—	103	104	121	106	107	—	97	102	134	91	95
26	—	84	84	102	101	101	—	86	87	92	86	87
27	—	90	92	121	90	92	—	96	100	115	86	89
28	—	93	98	147	89	93	—	102	106	119	88	91
29	—	88	93	142	82	87	—	99	104	119	82	86
1930	—	82	89	167	77	84	—	96	99	100	77	80
31	—	77	83	154	76	82	—	89	91	87	70	72
32	—	75	81	146	76	81	—	83	85	79	66	68
33	—	71	75	121	72	76	—	81	82	66	61	62
34	—	68	72	119	67	71	—	85	87	77	63	65
35	—	70	74	119	67	71	—	90	91	75	66	67

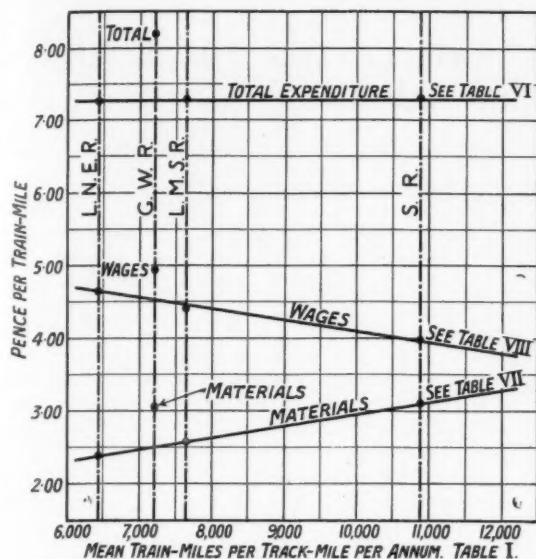


Diagram A

0.15d. per mile for each additional 1,000 trains per track, while materials *increase* by an almost equal amount, allowance must be made for the fact that during the period under review wages rates have varied, and there have been considerable fluctuations in the price of material; the chart does not, therefore, provide more than an indication of the trend of expenditure as traffic density increases. Every increase in number of trains adds to the difficulty of fettling the track, which difficulty is of course enhanced by the presence of a live conductor rail, as on a growing proportion of the Southern Railway. It is generally recognised that where conditions are such as to increase the troubles of day to day maintenance work the wear and tear of material is also increased.

The foregoing survey does at least support the contention of permanent way engineers that unless maintenance staffs are given adequate facilities, it is difficult to obtain more than a short life from the material. On three of the groups the average traffic density has remained relatively constant for thirteen years, with a maximum figure of 8,010 on the L.M.S.R. during 1935; on the Southern, however, which in 1923 showed 9,230, the density had risen to 12,600 by last year, and further extensions of electrified working may progressively complicate the problem of efficient maintenance.

RESONANCE IN ROLLING STOCK

From a correspondent

RESONANCE effects in locomotives and carriages are studied but rarely in the design stage, and comparatively little is known about the practical side of the subject, possibly because the effects are not always directly apparent and become obvious only by the failure of some part or through a derailment. Nor does it appear to be realised that numerous locomotive designs in use on fast and semi-fast trains have a natural tendency to derail, mainly through their resonance characteristics, and when derailments occur with such types minute investigations are made on the state of the track at the time of the accident with the subconscious idea that the track must be at fault, whereas an equally minute study of the locomotive on the basis that it has a natural tendency to derail would probably reveal the true cause and lead to an improvement in locomotive stability generally.

Resonance itself cannot be avoided in railway vehicles (although it may be damped out) because of the many factors tending to set it up. For instance, a single pair of coned wheels running on a dead straight track has a periodic side-to-side oscillation, the time of which can be calculated if the gauge, wheel diameter and tread taper are known. An ordinary four-wheeled bogie has a similar movement but of a different order. Moreover, every vehicle has a periodic vertical oscillation on its springs, and further regular oscillations are set up by the passage over rail joints. In a vehicle with several pairs of wheels the various oscillations frequently cancel each other out, but it is by no means impossible for one or more sets of oscillations to get into phase, and this synchronisation may be of so dangerous a magnitude as to cause derailment, or perhaps the failure of a part with a normal factor of safety running into double figures.

A theoretical approach to the problem is scarcely possible, for it is not easy to determine the mass of such constituents as crank axles with rods and eccentrics attached; further, play in the big end and axlebox bearings introduces considerable complications. A common solution, usually applied as a preventive, is to bring into operation mechanical friction, e.g., the use of laminated

springs; but this particular example has the disadvantage of requiring a large increase over the static load to overcome the inter-plate friction, and smaller shocks are thus transmitted solidly. On the L.M.S.R., Ferobestos pads have been applied to the bogies of various passenger locomotive classes in order to nullify the effects of resonance in the bogies, and at high speeds their effect has been to add several miles an hour to the highest possible speed which can be attained by the Pacific and 4-6-0 locomotives. A wider application of parallel, or 1 in 40 taper, tyre treads has been made on a number of railways in an endeavour to eliminate or reduce the natural oscillations of the wheels, but the rapid wear of the tread must nullify the advantage after a short time, and in any case only half of the problem has been tackled, for the rails have been kept to the 1 in 20 cant.

As far as locomotives with a symmetrical wheelbase are concerned it has become a common practice to make the spring systems at each end asymmetrical, and within the last year or two hydraulic shock absorbers have been introduced with considerable success to both medium and high speed steam and electric locomotives and also to diesel trains. Apart from super-speed vehicles, the ordinary coach and the simple double-bogie electric locomotive, which have no inherent stability, are most in need of resonance damping devices, whether they have sprung swing link bogies or solid centre supports. Records exist of an electric locomotive with the Bo-Bo wheel arrangement and sprung bolsters which could not be run above 45 m.p.h. on account of dangerous oscillations, but which rode steadily at 60-65 m.p.h. after two hydraulic dampers had been fitted to each bogie. In the case of Pacific and Mountain steam locomotives the control of the usually excessive hunting on the straight of the trailing wheels can be eliminated more effectively by hydraulic devices than by any spring or gravity control system. Fittings of this type not only give safer running and prevent destructive lateral blows to the track, but also enable the driver and fireman to work with greater efficiency and with less fatigue.

NEW SINGLE-EXPANSION 2-6-6-4 TYPE ARTICULATED LOCOMOTIVES, NORFOLK & WESTERN RAILWAY

These engines, each developing a tractive force of 104,500 lb., have been built for fast freight service and are capable of speeds of 60 to 65 m.p.h.

WE are indebted to Mr. R. G. Henley, Chief of Motive Power, Norfolk & Western Railway, U.S.A., for the photographs and drawings reproduced of one of two new 2-6-6-4 articulated locomotives built at the Roanoke works of the railway company and placed in service a few months back. These engines, although not actually the largest of their kind in the United States, are of exceptional size and power, developing a tractive effort of 104,500 lb. and having four single-expansion cylinders measuring 24 in. dia. by 30 in. stroke. The overall length of engine and tender is 120 ft. 7½ in., and tests have shown that the engines can develop over 6,000 h.p. at speeds ranging from 32 to 57 m.p.h., with a maximum of 6,300 h.p. at 45 m.p.h. The chart reproduced shows the drawbar pull and drawbar horsepower compiled from dynamometer tests made with one of the engines when it was handling a freight train of relatively low tonnage at high speed.

In working order and complete with tender—the latter carrying 26 U.S. tons of coal and 22,000 U.S. gallons of water—the weight of the engine is 423 tons 10 cwt. Tests have shown that the locomotives can handle 4,800-ton trains on grades of 1 in 200 at 25 m.p.h. without difficulty, whilst on comparatively level tangent track a speed of 64 m.p.h. has been obtained with a train weighing 7,500 tons.

The main particulars are as follow:—

Cylinders (4) single-expansion, dia.	24 in.
Piston stroke	30 in.
Wheels, coupled	5 ft. 10 in.
Leading truck	3 ft. 0 in.
Trailing truck	3 ft. 6 in.
Wheelbase, coupled	35 ft. 5 in.
" rigid	12 ft. 4 in.
Trailing truck	5 ft. 0 in.
Engine, total	60 ft. 4½ in.
Engine and tender, total	108 ft. 7½ in.
Boiler, steam pressure	275 lb. per sq. in.
Heating surface:—	
Firebox and combustion chamber	530 sq. ft.
Arch tubes	57 "
Firebox, total	587 "
Tubes and flues	6,063 "
Total (evap.)	6,650 "
Superheater	2,703 "
Combined (evaporative and superheater)	9,353 "
Grate area	122 "
General data:—	
Rated tractive force: engine 75 per cent. cut-off	104,500 lb.
Speed at 1,000 ft. per min. piston speed	41.6 m.p.h.
Piston speed at 10 m.p.h.	240.1 ft. per min.
R.p.m. at 10 m.p.h.	48
Weight in working order, engine	254½ tons
" " tender	169 tons
" " (total)	423½ tons
Adhesion weight total	192 tons

Frames, Cylinders, and Wheels

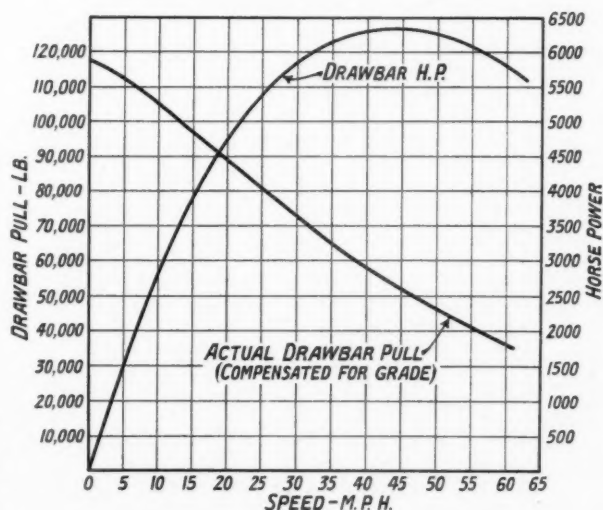
The engine frames, cylinders, and frame cross members are all cast integrally in the form of two bed castings (illustrated). It is estimated that by use of these cast-steel frames, 66 major parts and 634 minor parts were displaced. The cylinders are spaced 7 ft. 8 in. between centres, and steam is distributed to them by 12-in. piston valves having a maximum travel of 8½ in.; the maximum

cut-off is 75 per cent. The steam lap is 2 in., exhaust ⅞ in., and lead ¼ in. The valves are operated by Baker motion controlled by power reversing gear. The cross-heads and guides are of the multiple bearing type, and the axles, crank-pins, and rods are of normalised open-hearth carbon-steel forgings.

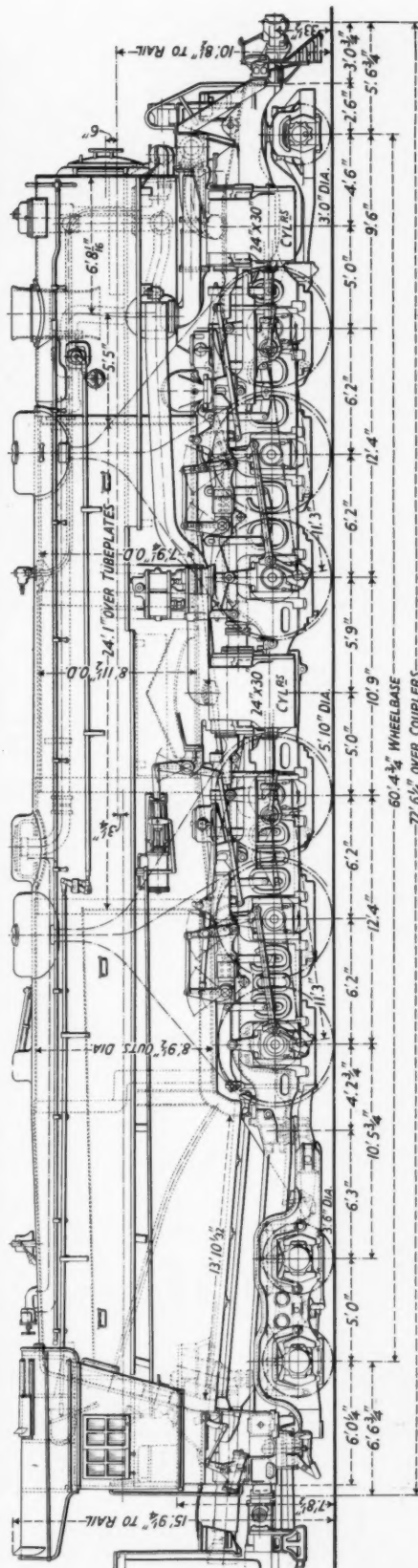
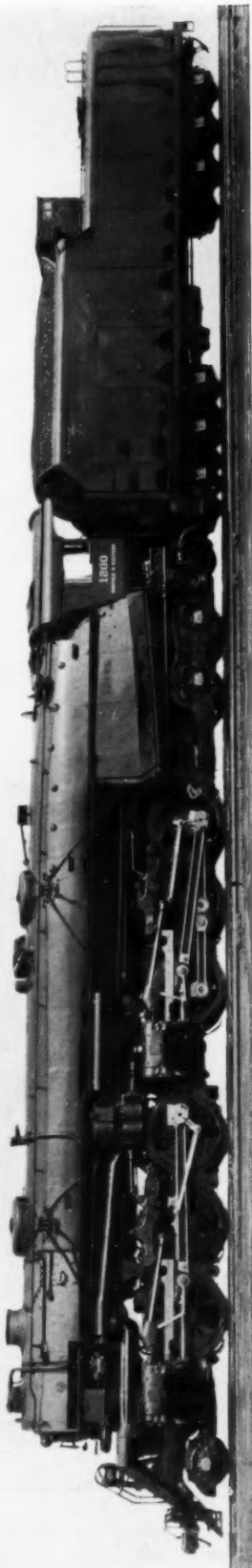
All wheels of both engines have Timken roller bearings, although in the case of the tenders one of them has Timken and the other A.S.F. units. The coupled wheel arrangements are of special interest, being the first of their kind. The driving wheel assembly consists primarily of the wheels and axles; the axle tube or sleeve; the roller bearings; and the driving boxes. The roller bearings are recessed into the wheel hubs, and the axles carry none of the weight of the locomotive, which is supported by the tubes. The outer races of the roller bearings are fitted into a recess in each coupled wheel hub, and the inner races are pressed on to the ends of a finished axle sleeve or tube, the latter being supported in the driving boxes. The axles are hollow bored.

Boiler and Firebox

The boiler is of interest on account of its size, its length overall being 60 ft. 9½ in. The boiler barrels are constructed in four sections ranging in diameter from 7 ft. 7 in. inside at front to 8 ft. 9½ in. outside at the back end, the first two sections of the barrel being built up of carbon steel plates 1½ in. thick, whilst the third and fourth sections are of 1-in. and ¾-in. thick nickel steel plates. The firebox is electrically welded throughout and the grate is 13 ft. 10 in. long by 8 ft. 10½ in. wide, the grate area being 122 sq. ft. A combustion chamber 9 ft. 8 in. long is provided, and the boiler has 239 superheater flue tubes 3½ in. diameter, and 57 2¼-in. diameter tubes, 24 ft. 1 in. long. The construction of each boiler involved the use of 2,970 rivets and 4,925 stay-



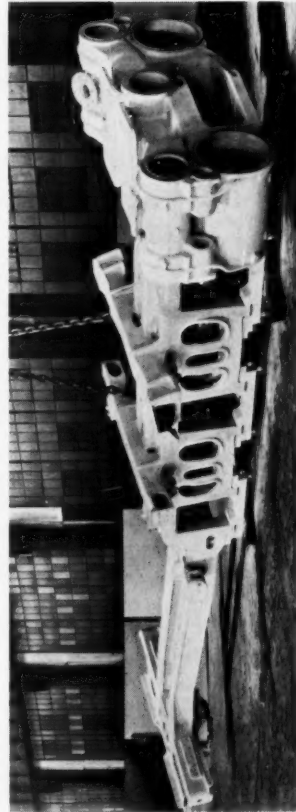
Drawbar pull and drawbar h.p. compiled from dynamometer tests at speeds up to 60 m.p.h.



New 2-6-6-4 type single expansion articulated locomotive: Norfolk & Western Railway



Front end cylinder and bed casting



Rear end casting



New articulated locomotive heading a heavy freight train

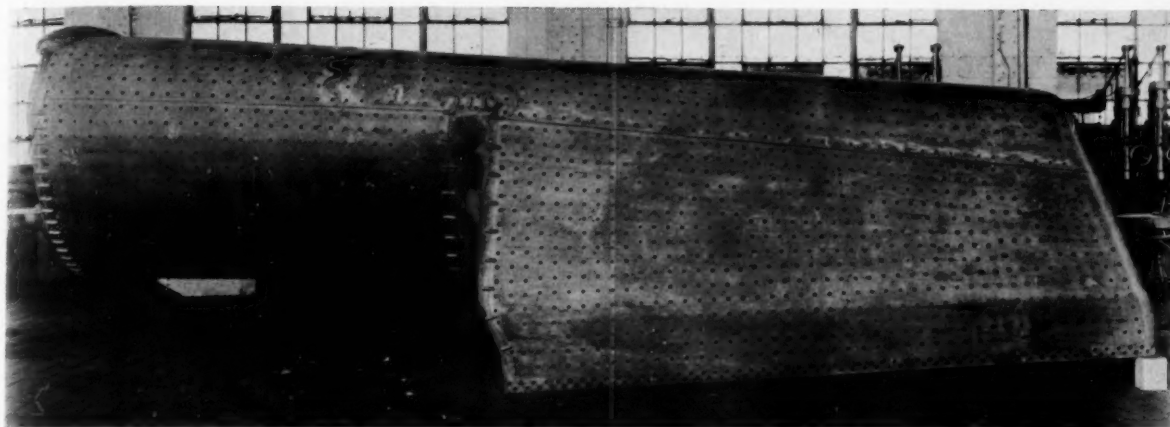


Front end view of engine



View of rear end, showing cab and connections

NEW 2-6-6-4 TYPE ARTICULATED LOCOMOTIVES, NORFOLK AND WESTERN RAILWAY

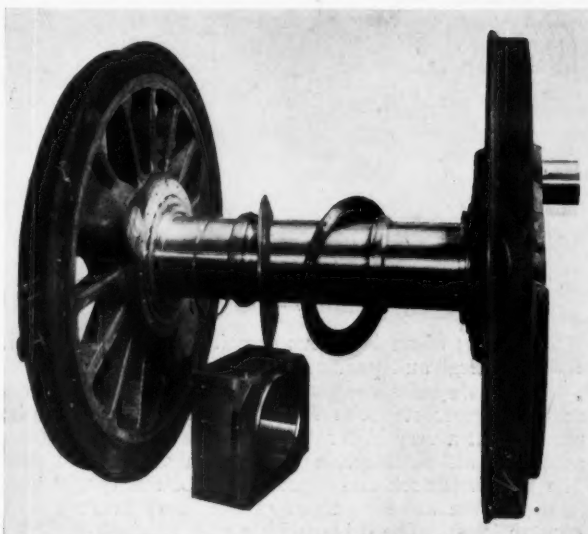


Electrically-welded interior firebox with combustion chamber

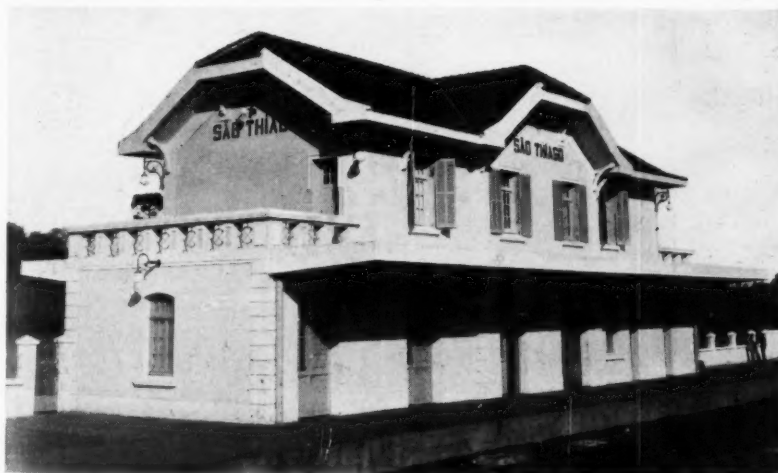
bolts. The boiler holds 8,100 gallons of water at the working height and 9,835 gallons when full; it is of interest to note that there is an expansion in length of $1\frac{1}{8}$ in. from cold to 330 lb. test pressure. The boilers are designed for a working pressure of 300 lb. per sq. in. but the safety valves are set to work at 275 lb. An Elesco type E superheater with an American multiple throttle is used, and the Worthington feedwater heater has a rated capacity of 12,000 gallons an hour. Fuel is supplied to the firebox by a standard type mechanical stoker, and the firebox is equipped with a brick arch having five $3\frac{1}{2}$ -in. diameter arch tubes.

High Power/Weight Ratio

Our contemporary the *Railway Mechanical Engineer*, in commenting upon these remarkable engines, calls attention to the fact that for a freight locomotive, and particularly one of the articulated type, the development of an indicated horsepower with less than 85 lb. of total engine weight, and a drawbar horsepower with 90 lb. of engine weight, is a notable achievement, a statement which will be agreed by everyone concerned with locomotive design and performance. A limit of 100 lb. per drawbar horsepower is not exceeded within a speed range of about 30 m.p.h.



Timken bearing assembly on driving pair of wheels



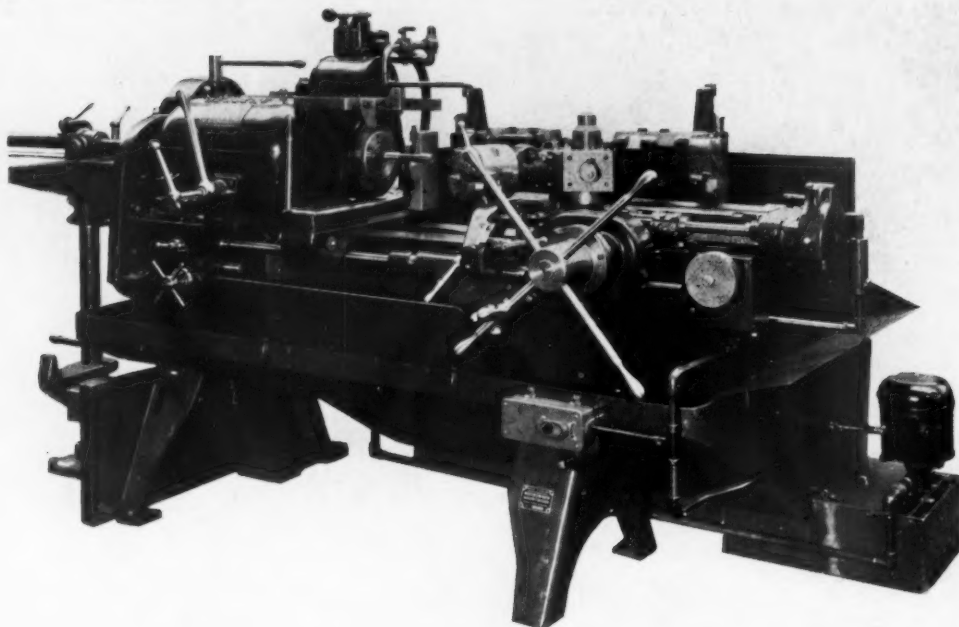
A typical modern station building in Brazil

São Thiago station, Jaguary-São Thiago-São Borja Extension, Rio Grande do Sul Railway

This example of modern constructional practice in Brazil was opened for traffic in June, 1936. A description of the building of and bridges on this new extension was published in our issue of October 23 last

PRODUCTION OF STAYBOLTS FOR LOCOMOTIVE BOILERS

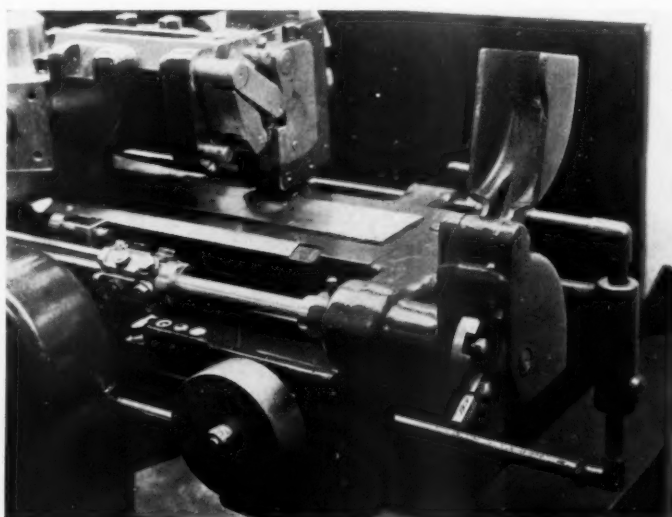
A new Herbert lathe specially designed for this purpose



BY means of an ingenious combination of mechanical, electrical and pneumatic controls, the new Herbert No. 4 special copper stay lathe, illustrated above, enables copper staybolts for locomotive fireboxes to be produced at a very high rate of production and with great accuracy, without imposing any strain on the operator. The bed, headstock and capstan slide of this special stay lathe are the same as those of the same firm's No. 4 capstan lathe. The drive is by a self-contained two-speed motor mounted at the back of the machine, through vee-ropes. The two-speed motor provides an instantaneous speed change from fast speed for turning and cutting-off to slow speed for threading and *vice versa*. The speed changes are controlled by a drum-type switch operated by the capstan slide, this feature having been provisionally patented. The bars from which the stays are made are gripped in a Herbert air-operated dead-length bar chuck which opens and closes instantly in response to the movement of the small lever-operated valve seen in the second illustration. Immediately the chuck is opened the bar is fed forward to an adjustable stop in the capstan slide by means of a pusher rod actuated by weights.

On page 25 is shown the layout of tools, and the sequence of operations can be followed by referring to the numbers. (1) The bar is fed out to the stop and (2) the capstan is withdrawn bringing into position a special cam-operated roller-steady turning tool. The automatic feed to the capstan slide is then engaged and the roller-steady tool traverses the length of the stay, the cutting tool being automatically fed in to reduce the diameter of the stay in the centre by

means of the two adjustable stops which can be seen on the horizontal bar immediately above the chuck. The bar is graduated to facilitate setting the stops for various lengths of stays. (3) The feed is tripped by means of the adjustable stop on the hexagon stop bar in front of the capstan slide; the capstan is then withdrawn, bringing into position a Herbert 1½-in. Tangel diehead. As the diehead is brought forward one of the arms on



Automatic electric speed change. Disc on right is rotated automatically by the motion of the capstan slide and the arms operate a drum-type switch

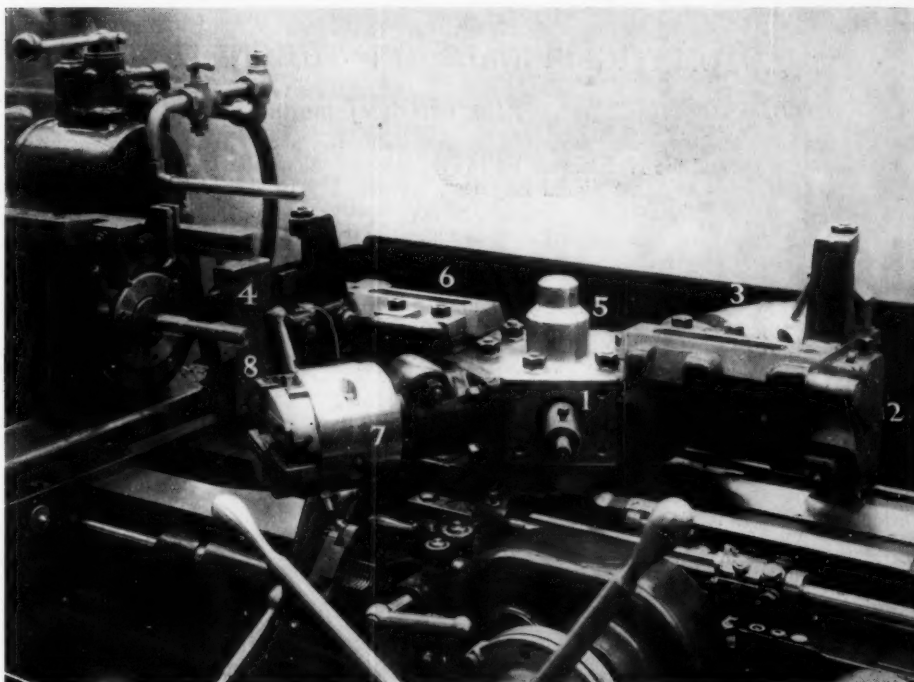
a rotating disc attached to the rear of the hexagon stop bar engages with and operates the drum-type switch seen in front of the bed, thereby slowing down the speed of the motor and consequently the work spindle. A nut carried on the capstan slide is now engaged with the leader on the front of the lathe by means of a small lever. This feeds the diehead along the stay, controlling the pitch and carrying the dies over the recessed portion of the stay. Upon completion of screwing the leader-nut runs into a gap on the leader, the motion of the capstan slide is arrested by a stop on the hexagon stop bar, and the diehead opens in the usual manner.

The capstan slide is next withdrawn, and when it is fed forward again to bring the adjustable stop (5) into

position, the speed of the motor is increased by means of the drum-type switch. (4) Cutting-off and chamfering is done by two tools carried on a lever-operated cross-slide. It should be noted that the capstan slide is fitted with two sets of tools, so that two stays are produced per cycle, thus eliminating idle time. Operations 5, 6, 7, and 8 are therefore repetitions of operations 1, 2, 3, and 4.

Copper stays 1 in. diameter, 11 threads per in., $5\frac{1}{2}$ in.

long, are produced at the rate of 30 seconds each. The range of copper stays handled by the machine is from $\frac{7}{8}$ in. to $1\frac{3}{4}$ in. diameter, and from 4 in. to $8\frac{3}{4}$ in. long. The automatic closing of the Tangel diehead saves valuable seconds and relieves the operator of the separate physical effort required to close the diehead manually. The closing handle strikes a plate fitted to the top of the capstan slide when the capstan is rotated.



The above illustration shows the layout of tools and sequence of operations

New Name Boards on L.M.S.R. Trains



Standard L.M.S.R. main-line coach with new type of coach name board. After experimenting on the Birmingham—Euston service, the L.M.S.R. has decided to introduce on its principal express trains name boards placed in a prominent position on the sides of the coaches above the windows instead of on the roof as is the more usual custom; these boards show the starting point and destination of the train

AUTOMATIC SIGNALS ON THE NETHERLANDS RAILWAYS

Elimination of manual signal boxes

BY the courtesy of the Netherlands Railways, expressed through their Assistant Signal Engineer, Mr. J. H.

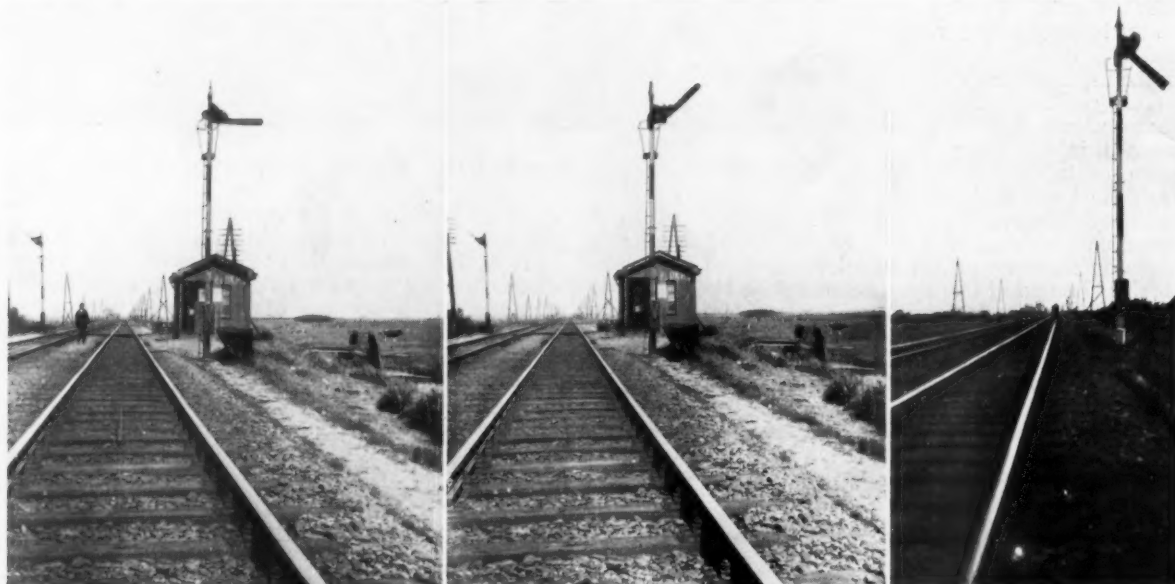
Verstegen, we are able to reproduce the accompanying illustrations of automatic signals on that system. It is only in comparatively recent years that such signals have been adopted in the Netherlands, chiefly for reasons of economy. For many years the double lines have been equipped with the lock-and-block system of Siemens and Halske, the "normally free" pattern being used on the Holland Company's lines and the "normally locked" on the State system. Since the working arrangement between the two, set up in 1919, the latter type of apparatus has been adopted as standard, as it possesses additional advantages of particular value in foggy weather.

There are a great many level crossings in the country, and at one time it was customary to have barriers and

Gouda and Oudewater, with four automatic block sections in each direction. This has since been followed by others between Berkum and Dedemsvaart; Utrecht and Vleuten; Amsterdam and Weesp; Dordrecht and Willemsoord; Tilburg and Gilze-Rijen; and Boxtel and Best. Work is in hand between The Hague and Leiden, and is being planned for the section between Schiedam and Hook of Holland.

Choice of System

The various methods of working automatic signals were carefully investigated before the Gouda-Oudewater installation was decided on, and it was found that for the conditions obtaining on the steam worked sections of the Netherlands Railways the primary battery semaphore system was the most suitable; this system has been adopted for all the work named above, except on the electrically worked



Automatic stop signal, danger position

Automatic stop signal, clear position

Automatic distant signal, caution position

watchmen thereat, so that it was often convenient to set up an intermediate block post at a crossing and let the signalman act as gateman. After the war, when wages steadily increased, the expense of these crossings became very great, and permission was eventually obtained from the Minister of Public Works to do away with the barriers, wherever possible, and replace them by warning signs. This suggested the possibility of eliminating some of the block posts, and after a visit to America by some officers of the railways, it was decided to make a trial of the automatic block system.

In his address before the Institution of Railway Signal Engineers on November 13, 1930, the Signal Engineer of the Netherlands Railways, Mr. G. J. de Vos van Nederveen Cappel, stated that no economy was found to result from the replacement of a single intermediate block post, but directly two or more could be eliminated the automatic system showed decided advantages. The first installation was put into service on June 8, 1926, between

sections, where alternating current track circuits have, of course, to be used. The use of light signals, with approach lighting, was considered, but although some light signals are in use where circumstances make it really desirable, the Netherlands Railways are inclined to be less enthusiastic in this respect than some other lines, considering that the semaphore, provided the lighting is really efficient, has certain advantages not lightly to be brushed aside.

The signals consist of a stop signal at the entrance to the block sections, preceded by a distant. The stop signals have round-ended arms, extending to the right of the post; the positions are horizontal for "stop" (red light), and 45 deg. in the upper quadrant for "clear" (green light). The distant signals have square-ended arms; at 45 deg. in the lower quadrant (yellow light) they indicate "caution," and at 45 deg. in the upper quadrant "clear" (green light). The arms are painted plain red in front, and white with two black diagonal bars at back. The posts are painted in black and white stripes, as on



Track relay cupboard and battery pit, Netherlands Railways

the latest L.M.S.R. signals. In order to keep the circuits as simple as possible, the "normal clear" system was adopted, with signal arm proving contacts, arranged as on the London Underground, to extend the control of a signal past a false clear indication to the next signal working correctly. It is interesting to note that no instance of a signal failing to go to danger has as yet been observed.

The track circuits are fed by two caustic soda or Leclanché-cells. The sections extend up to about 1,800 m. (1,968 yd.); cut-section control is provided where more than one control the same signal. The signal motors are mounted on the arm spindles and operated by a sixteen-cell battery in a concrete well alongside. Double rail bonds are used. At first the insulated joints were made of large hard wood blocks, the rails being flat-bottomed, but later the Weber type was adopted.

Controlling Circuits

In the first installation between Gouda and Oudewater it was considered advisable to use line relay control for the signals, with the signal relay circuit taken over the track relays for all the track circuit sections concerned. In the Berkum-Dedemsvaart installation the control was derived from the first track circuit only, reliance being placed on the cut-section action from the circuits in advance. This method proved quite satisfactory and has been adopted in all subsequent work. The line control between stop and distant signals has been superseded by polarised track circuit control. Overlaps, about 100 m. (109 yd.) long, are provided in advance of the stop signals, and telephones at the latter enable trains stopped there to communicate with the adjacent signal-boxes.

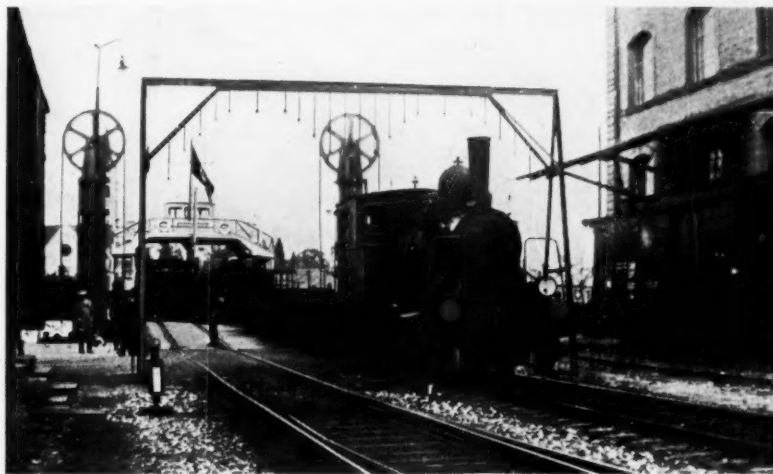
At the point where the automatic block begins, the last manual signal is equipped with a replacer, and where it ceases the lock-and-block apparatus is so arranged that it must be used to protect each train before the rear

automatic block section can be cleared. In this way continuity of working is effectively secured. The track circuit is always divided at distant signals, so that they cannot assume the "clear" position behind a train which is approaching the relative stop signal, to provide against misunderstanding in the event of the stop signal in the rear having to be passed at "danger."

Results Obtained

The experience with the automatic system has been uniformly satisfactory, the failures being very few indeed. In five years' working between Gouda and Oudewater, with eight block sections, there were 12 failures due to defects in the equipment, 4 to careless working on the line, 1 to an irregular shunting move, and 2 to rail breakages. There was also 1 failure of a semi-automatic signal, but not attributable to the automatic equipment proper. All these failures affected stop signals. In the same period of five years there were only 3 distant signal failures.

In four years' operation of the Berkum-Dedemsvaart installation there were 3 failures of stop signals due to defects and 3 of distant signals; for 2 semi-automatic signal failures, and 2 of distant signal, no cause was discovered. Some trouble was experienced with bonded joints at level crossings, in consequence of which the rails have been relaid so as to eliminate such joints altogether, and a small amount of difficulty with the earliest design of relay, now superseded. Considering the putting to danger and clearing of a signal to constitute one movement, the failures in the first installation were about 0.9 per 100,000 movements, all signals included, and slightly more in the Berkum-Dedemsvaart installation; the number of signals, however, is not quite the same, so that there was 1 failure per 15,000 trains in the one case and 1 per 30,000 trains in the other. The figures show that not only is the apparatus, supplied by the General Railway Signal Company, Rochester, New York, well constructed but that it is also well maintained by the railway staff. The costs of upkeep have proved to be well within both estimated and allowable limits. It is therefore likely that further sections of automatic signalling will be provided as the necessity for increasing the number of block sections and shortening train headways makes itself felt.

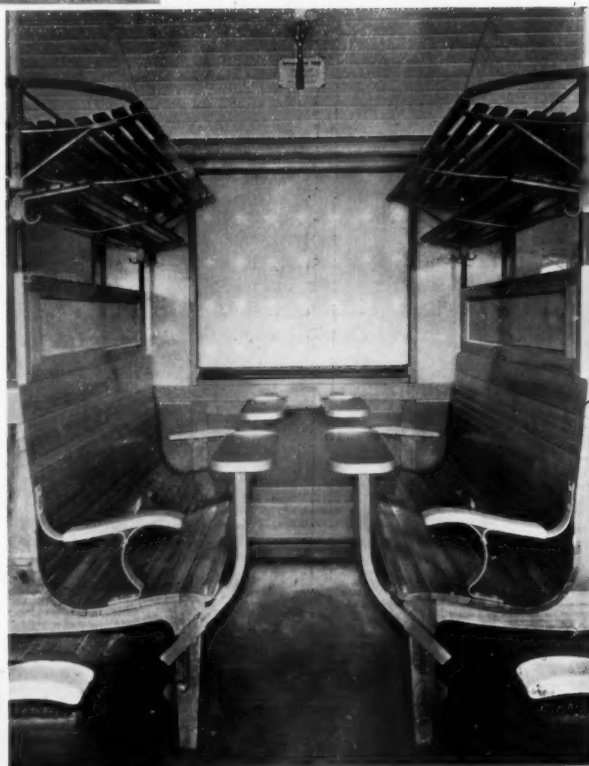


Loading the German wagon ferry at Romanshorn, Switzerland. It runs from this point across Bodensee (Lake Constance) to Friedrichshafen. The Lake services were described in an article in our issue of October 19, 1934



Left: A narrow-gauge train traversing the streets of Iquitos, Peru. Not only goods but passengers are carried on this railway

Below: Beyer-Garratt locomotive of the Sierra Leone Government Railways taking in water at Freetown. This system comprises some 328 miles of 2 ft. 6 in. gauge track. The main line runs from Freetown on the coast to Pendembu. It was opened to Songo in May, 1899; Rotifunk in 1900; Bo in 1902; and completed to Pendembu in 1905. A branch from Bauya Junction was opened to Yonibana in 1912 and extended to Makeni in 1914. By far the most important traffic consists of the transport of palm kernels



Above: Interior of third class compartment of the latest type of Swiss Federal Railways main-line stock showing the useful collapsible tables and stout double luggage racks



RAILWAY NEWS SECTION

PERSONAL

Mr. J. Taylor Thompson, M.C., A.M.Inst.C.E., who, as announced in THE RAILWAY GAZETTE of December 11, has been appointed Assistant Engineer, North Eastern Area, L.N.E.R., received his early training on the North Eastern Railway at Newcastle. He was later engaged principally on new works, including the



Mr. J. Taylor Thompson, M.C.,
Appointed Assistant Engineer, North Eastern Area, L.N.E.R.

extension of the Ponteland Railway, and was intimately associated with the pre-war schemes for developing the coal shipping facilities on the North-East Coast, being engaged in particular on the design and construction of the new staiths at Dunston and Blyth. After the war, during which he was in command of a Royal Engineer Section attached to the Artillery on the Western and Italian fronts, he carried out the important underpinning work on the foundations of the High Level bridge at Newcastle. He subsequently had charge of the reconstruction both of the roadway portion, which was strengthened to carry tramlines over the bridge—to link up Newcastle and Gateshead—and of the Red Barns tunnel in Newcastle. In 1925 he became Personal Assistant to the Engineer (Mr. John Miller, B.E., LL.D., M.Inst.C.E.), and later Assistant to Engineer, being concerned largely with constructional work, including the widening of the main line between York and Northallerton and the New Inward Goods Yard at Hull. It was in August, 1935, that Mr.

Thompson was transferred to Darlington as District Engineer, the position he now vacates on promotion to Assistant Engineer, North Eastern Area.

INSTITUTION OF CIVIL ENGINEERS

Mr. C. B. H. Clark, B.Sc. (Engineering, London), Docks Department, Southern Railway, Southampton, has been transferred from the class of associate member to that of full member as from December 15.

INSTITUTION OF RAILWAY SIGNAL ENGINEERS

The Council of the institution has nominated the following officers to fill vacancies occurring on February 24 next:—

President: Mr. H. M. Proud, Chief Commercial Engineer, Westinghouse Brake & Signal Co. Ltd.

Vice-President: Mr. G. H. Crook, Chief Assistant to the Signal Engineer, G.W.R.

Hon. Treasurer: Mr. T. S. Lascelles, Engineer, W. R. Sykes, Interlocking Signal Co. Ltd.

Hon. Secretary: Mr. M. G. Tweedie, Signal Engineer's office, G.W.R.

Members of Council, (a) (nominated for election en bloc by ballot): Messrs. J. Boot, F. L. Castle, F. J. Dutton, E. W. Hallam, F. Horler, W. R. Jones, H. W. Moore and A. Oldham; and (b) (nominated by ballot to fill eight vacancies): Messrs. H. H. Dyer, J. H. Fraser, S. L. Glenn, C. H. Hills, L. J. M. Knotts, P. Lomas, R. F. Morkill, A. Moss, and F. H. D. Page.

G.W.R. APPOINTMENTS

The following appointments are announced by the Great Western Railway:—

Mr. H. J. Hoskins, Goods Agent, Paddington, to be District Goods Manager, London, vice Mr. A. S. Mills, who retired at the end of 1936.

Mr. W. A. Lambert, Goods Agent, South Lambeth, to be Goods Agent, Paddington.

Mr. T. H. Daniels, Assistant Goods Agent, Paddington, to be Goods Agent, South Lambeth.

Mr. J. W. Hearn, Chief Clerk, trade advertising section, office of the Superintendent of the Line, to be Trade Advertising Agent, vice Mr. H. A. G. Worth, who resigned at the end of 1936 to take up an appointment with the London Passenger Transport Board.

Mr. G. Dyall, Chief Clerk, publicity section, office of the Superintendent of the Line, to be Chief Clerk, publicity and trade advertising sections, office of the Superintendent of the Line.

Mr. T. F. Stacey, junior Assistant

to Divisional Superintendent, Swansea, to be Chief Clerk, Divisional Superintendent's office, Newport.

Mr. A. L. Waterman, Estate office, Bristol, to be District Estate Agent, Bristol.

Mr. A. S. Mills, who, as just announced above, retired yesterday from the position of London District Goods Manager, Great Western Rail-



Mr. A. S. Mills,
London District Goods Manager,
G.W.R., 1927-36

way, entered the company's service in 1893 in the Chief Goods Manager's office, but two years later was transferred to the General Manager's office, where he remained for 12 years. He was afterwards attached to the office of the Superintendent of the Line, where he had considerable experience of the indoor and outdoor work of the goods train running department, and in carrying out parliamentary and other special duties under the late Mr. Charles Aldington. In 1912 he was posted to the General Manager's office for one year, for special staff duties, afterwards returning to the office of the Superintendent of the Line. In 1919 he went back to the General Manager's office for the third time to take charge of one of the sections dealing mainly with matters arising in connection with the passing of the Ministry of Transport Act, 1919, and the Railways Act, 1921. In January, 1922, Mr. Mills was appointed Chief Clerk and Assistant to the London District Goods Manager, and in October of the same year he was placed in charge of Smithfield Goods

station. In January, 1923, he was appointed Assistant District Goods Manager, London, and three years later he was transferred to Worcester as District Goods Manager. In 1927 he returned to London to take over the position of District Goods Manager, and, during his tenure of this office, the London Goods District has been greatly enlarged by the absorption of the Reading District.

Mr. H. A. G. Worth, who, as stated above, resigned on December 31 from



Mr. H. A. G. Worth,

Trade Advertising Agent, G.W.R.,
1934-36

the position of Trade Advertising Agent to the Great Western Railway to take up an appointment with the London Passenger Transport Board, joined the G.W.R. in March, 1913, in the Chief Engineer's office, and two years later became personal clerk to the Chief Engineer. In 1916 he joined the Army and served as an officer in the Royal Field Artillery. He was dangerously wounded at Ypres in the following year. Shortly after his return to civilian life he was posted to the office of the Superintendent of the Line, and later to the London Divisional Superintendent's office. In August, 1930, Mr. Worth was transferred to the newly-created Commercial Advertising Department, and early in 1934 was appointed junior Assistant to the Divisional Superintendent at Newport. It was in July of that year he became Trade Advertising Agent.

Mr. J. W. Hearn, who, as we have just announced, has been appointed Trade Advertising Agent, Great Western Railway, joined that company's service at Paddington in 1893, and, after service in the Rolling Stock Department, the Chief Engineer's office and General Manager's office, went to Plymouth in 1901, where he served in the Divisional Superintendent's office

and at various stations in the division. In 1902 he was transferred to the parcels office at Wolverhampton, returning to the Superintendent of the Line's office at Paddington in 1906. In 1924 Mr. Hearn was appointed the company's representative at the British Empire Exhibition at Wembley. After the exhibition he returned to Paddington, in 1925, and in 1930 became Chief Clerk in the then newly-formed Trade Advertising Department, the position he now relinquishes on his promotion to be Trade Advertising Agent, in suc-



Mr. J. W. Hearn,

Appointed Trade Advertising Agent,
G.W.R.

cession to Mr. Worth, who has just resigned.

Mr. W. A. Lambert, who, as announced above, has been appointed Goods Agent at Paddington, G.W.R., joined that company's service at Wellington, Salop, in 1897. In 1904 he was transferred to Poplar, and, after service at several London depots, was appointed Chief Clerk at South Lambeth in 1922. In 1925 he became Cartage Superintendent at Paddington Goods station, and in 1933 returned to South Lambeth as Goods Agent, the position he now vacates to take up a similar one at Paddington.

Mr. T. H. Daniels, who, as announced above, has been appointed Goods Agent, South Lambeth, G.W.R., joined that system at Bridport in 1899 and after service at Chippenham and Bath stations was transferred to the Chief Goods Manager's office at Paddington in 1918. After service in several sections of this office he was appointed Goods Agent at Wolverhampton in 1931, but returned to London in 1934 to become Assistant Goods Agent at Paddington, whence he is now transferred to South Lambeth as Goods Agent.

Mr. G. Dyall, who as announced on page 29, has been appointed Chief Clerk in the publicity and trade advertising sections of the office of the Superintendent of the Line, G.W.R., joined the publicity section of that office in 1897, and has spent the whole of his railway career in it, except for a period extending from 1917 to 1920, when his services were loaned to the Coal Control Board. In 1930 he became Chief Clerk of the publicity section, the position he now vacates to assume charge as Chief Clerk of the



Mr. G. Dyall,

Appointed Chief Clerk, publicity and trade advertising
sections, office of the Superintendent of the Line, G.W.R.

publicity and trade advertising sections.

From *The London Gazette* of December 18:—

Regular Army Commands & Staff:

Major R. D. Waghorn, R.E., appointed Instructor (Cl.Z), Railway Training Centre, Royal Engineers, as from December 1.

Supplementary Reserve of Officers; Royal Engineers:

Mr. Eric Clarke to be 2nd Lieutenant (December 19).

Major Waghorn has until recently been employed on the Indian State Railways, mainly upon railway construction work on the North Western system. He is the son of the late Brig-Gen. Sir W. D. Waghorn, C.B., C.M.G., sometime President of the Indian Railway Board, whose death we announced in our issue of October 2 last.

Mr. Fairlie C. Pearson, who, as announced in our issue of December 25, has been appointed Assistant General Manager, Central Uruguay Railway of Monte Video and Associated Lines, joined the Buenos Ayres Great Southern Railway in 1904, and after serving at Plaza Constitución (Buenos

Aires) and Bahia Blanca, was transferred to the Olavarria traffic section. He afterwards served as Acting Piermaster at the Port of Ingeniero White, and later, on the Ingeniero White traffic section. When Mr. A. H. Coleman, who is at present in charge at Bahia Blanca, was appointed, Mr. Pearson was attached to his office, where he remained until 1908, when he joined the Buenos Ayres & Pacific Railway, being appointed Traffic Inspector on the Bahia Blanca Division. After serving successively at Junin and Laboulaye, he was transferred to Mendoza as Traffic Inspector of the home section, including the Transandine Railway, during the time the tunnel was under construction. In 1912 he was appointed Traffic Superintendent of the Cuyo Division, remaining there until August, 1914, when he again returned to Bahia Blanca as Traffic Superintendent of that division of the Pacific Railway. This was his headquarters until September, 1917, when he went to Montevideo as Traffic Superintendent of the Central Uruguay Railway, which position he has ever since occupied; he has on three occasions acted as General Manager during the absence of the latter on European leave.

Mr. G. V. Bernays, M.C., who, as announced in THE RAILWAY GAZETTE of December 25, has been appointed Traffic Superintendent, Central Uruguay Railway of Monte Video and Associated Lines, joined the former London & North Western Railway in January, 1914, and until June, 1915, worked at various stations, goods, and parcels offices. During the war he was granted a commission in the Duke of Wellington's West Riding Regiment, with which he served in France and Belgium, commanding a company with the rank of Captain from November, 1917, until demobilised. He was men-



Mr. Sydney Rogerson,

Appointed Publicity Manager,
Imperial Chemical Industries

tioned in despatches and awarded the Military Cross. On returning from war service in 1919, he spent six months on station duty, and was then transferred to the outdoor staff of the District Superintendent, South Wales District. In 1922 he was attached to the outdoor staff of the Superintendent of the Line at Euston, and in 1924 again transferred to Birmingham, L.M.S.R. He was appointed Assistant Traffic Superintendent of the Central Uruguay Railway in May, 1925, the position from which he has now been promoted to Traffic Superintendent.

Mr. J. W. McConnell has been elected a Director of the Canadian Pacific Railway, in place of Mr. W. A. Black, retired.

Mr. Sydney Rogerson has been appointed Publicity Manager of Imperial Chemical Industries Limited, following the centralisation of all publicity and advertising activities of the company and its subsidiaries. Mr. Rogerson, who is 42 years of age, first joined Imperial Chemical Industries in 1930. He was appointed by the late Lord Melchett and since then has controlled the company's press bureau which now becomes part of the Central Publicity Department. From that bureau during the past few years has come a continuous stream of information, reflecting the varied nature of the interests of Imperial Chemical Industries. Prior to 1930, Mr. Rogerson was for seven years Publicity Manager of the Federation of British Industries, which organisation he had joined on leaving the Army in 1919. (Some of his Army experiences are described in his book "Twelve Days," which two critics have referred to as "one of the best four war books.") At the Federation of British Industries his work brought him into contact with many industries, including the British film industry, with which he worked very closely in its early days. To his new and important position Mr. Rogerson brings an immense vitality and enthusiasm combined with a realisation of the possibilities which are before him and the great organisation which he serves.

Mr. Frederick James Dutton, who, as announced in our issue of December 11, has been appointed Divisional Signal and Telegraph Engineer for the London Midland and Scottish Railway at Derby, joined the former London and North Western Railway as an apprentice in the locomotive works, Crewe, where he remained for ten years. Afterwards he was transferred to the Signal Department of the L.N.W.R. at Crewe, under the late Mr.



Mr. F. C. Pearson,

Appointed Assistant General Manager,
Central Uruguay Railway of Monte Video



Mr. G. V. Bernays, M.C.,

Appointed Traffic Superintendent, Central Uruguay
Railway of Monte Video



Mr. F. J. Dutton,

Appointed Divisional Signal & Telegraph Engineer,
Derby, L.M.S.R.



Mr. William Crozier, O.B.E.,
Operating Manager (Scotland), L.M.S.R.,
1932-36

A. M. Thompson, assisting on works in the Lancaster, Crewe, Ravensthorpe and Walsall Districts. In 1919 he was appointed District Assistant (Signals) at Walsall, and seven years later went to Heaton Norris, L.M.S.R., in a similar capacity, his charge covering the Manchester District of the old L.N.W.R. He was transferred to Watford in 1928 as District Assistant (Signals), taking over the London area. In 1930 Mr. Dutton was promoted to be District Assistant (Signals and Telegraphs) at Stafford, his duties covering the area from Runcorn to south of Nuneaton, and in 1931 he became Assistant (Signals) to the Divisional Signal and Telegraph Engineer, Eastern Division, Derby, under Mr. A. Oldham. Since the retirement of Mr. Oldham in August, 1935, Mr. Dutton has been

acting as Divisional Signal and Telegraph Engineer at Derby, the position to which he is now appointed permanently. He is a member of the Council of the Institution of Railway Signal Engineers.

Mr. William Crozier, O.B.E., Operating Manager in Scotland for the London Midland & Scottish Railway, retired from active service at the end of December, after 47 years of railway service. He began as a boy at Glasgow in 1889, and after obtaining experience at several other stations and in the District Superintendent's office in Glasgow, was appointed, in 1898, as Relieving Agent for the then Western Division of the Caledonian Railway. During his seven years in this position he had an opportunity of taking the place, for a period, of practically every stationmaster in the Western Division. Mr. Crozier was promoted to the rates and fares section of the



Mr. A. V. Strange,
Secretary to the L.M.S.R. Savings Bank,
1924-36

gow, from 1923 until 1932. That period included the important era in transport when the main bus companies now operating in Scotland came into being, and in the negotiations under which the railway companies became largely interested in these concerns Mr. Crozier took a leading part. For his work in connection with the transport of troops and materials during the war he was created an Officer of the Order of the British Empire and, in 1930, he became a Justice of the Peace for the County of the City of Glasgow.

Mr. George Walmsley retired from the position of Assistant Traffic Manager, Great Southern Railways (Ireland), on December 31. He was educated at Santry School, Co. Dublin, and joined the former Midland Great Western Rail-



The late Mr. Percy Grant,
Managing Director, Vickers Train
Lighting Co. Ltd.

General Superintendent's office in 1905, and in 1909 became the company's representative at the Railway Clearing House in London, and was Chairman of the Passenger Train Rates and Fares Conference in 1912. He was appointed Assistant General Superintendent of the Caledonian Railway in 1916, and, on the amalgamation, he became Passenger Commercial Manager for Scotland, L.M.S.R., on January 1, 1923. In 1932, on the retirement of Mr. Robert Killin, the General Superintendent of the group in Scotland, Mr. Crozier was appointed to succeed him with the title of Operating Manager (Scotland). Mr. Crozier is particularly well-known and popular in railway circles in Britain, and will possibly be best remembered by the public of Scotland as the officer in charge of the passenger commercial business of the company at the Central station, Glas-



Mr. G. Walmsley,
Assistant Traffic Manager, Great Southern
Railways (Ireland), who has just retired



Mr. H. J. Hoskins,
Appointed District Goods Manager,
London, G.W.R.

way as a junior clerk in 1888 in the accounts office, North Wall, Dublin. After four years' service he was specially selected first as Accountant, and then in 1896 as Chief Clerk at North Wall depot. In 1902 Mr. Walmsley was specially selected to succeed Mr. Hildebrand, as Superintendent of the Sligo area, where he had charge of the working of the M.G.W., G.S. & W., and S.L. & N. lines. In 1914 he was appointed Assistant to the Traffic Manager at Broadstone. Following amalgamation in 1924 Mr. Walmsley became Assistant to the Commercial Manager, and on the retirement of Mr. Thomas Elliott and the appointment of Mr. Floyd as Traffic Manager, he was appointed Assistant Traffic Manager to the Great Southern Railways, from which position he now retires, at his own wish, after 48 years' service.

On December 21, at Kingsbridge, a presentation of a solid silver tea set and inscribed tray, with an address, was made to him by the members of the Traffic headquarters staff; also an Irish linen tea cloth for Mrs. Walmsley. Mr. Floyd, Traffic Manager, who presided, paid glowing tribute to Mr. Walmsley's many good qualities, official and social, and to his general popularity with the staff and public. Miss Murray, his private secretary, on behalf of the ladies, Mr. J. O'Dowd, Chief Operating Assistant, and Messrs. Robert Reade, Robinson, Brazil, Browne, O'Leary, Smith, Flanagan, and MacMahon all joined in voicing further appreciations of Mr. Walmsley, who suitably replied.

Mr. H. J. Hoskins who, as announced on page 29, succeeds to the position of G.W.R. District Goods Manager for the London area today on the retirement of Mr. A. S. Mills, joined the service at Taunton goods in 1902, and in 1917 was transferred to Hockley goods station. Five years later he was appointed representative in the Newcastle area, and in 1925 was transferred to Paddington as a headquarters canvasser. In 1927 he was promoted to the Lawrence Hill goods agency, and in the following year to the chief clerkship at Bristol Temple Meads goods. In 1930 he was transferred to Liverpool as Chief Clerk in the District Manager's office, and twelve months later to London as Assistant District Goods Manager. He was appointed to the post of Goods Superintendent at Paddington in December, 1934, which position he vacates on his present appointment, as District Goods Manager.

Mr. A. V. Strange, Secretary of the London Midland & Scottish Railway Savings Bank, retired from the service on December 31, 1936, and Mr. H. A. Parkes has been appointed to succeed him.

With Mr. Strange's retirement a long and distinguished association between his family and the L.N.W. and L.M.S. Railways has come to an end,

inasmuch as his father, grandfather, and great-grandfather all preceded him in the service. As his great-grandfather was actually engaged in an engineering capacity in the construction of the first section of the London & Birmingham Railway (opened from Euston to Boxmoor on July 20, 1837, and from Boxmoor to Tring on October 16, 1837), the family association with the railway out of Euston may be said to be older than the railway itself. Mr. A. V. Strange himself has served under six Secretaries of the L.N.W.R. and L.M.S.R. Companies—Messrs. Thomas Houghton, W. R. Haywood, James Bishop, R. C. Irwin, F. G. Evans, and O. Glynne Roberts. He entered the Audit Office of the L.N.W.R. in June, 1891, and on January 1, 1895, was transferred to the Savings Bank office, which was established on that date. On March 1, 1911, he was appointed Secretary of the Savings Bank, being the second holder of that office, and in 1914 there was added to his responsibilities control of the Stores Section (at that time under the supervision of the Secretary of the company), together with the secretariats of the Locomotive & Engineering Committee and the Stores Committee. In 1922, however, upon the amalgamation of the L.N.W. and L. & Y. Railways, Mr. Strange relinquished his charge of the Stores Section and the secretariats of the two committees mentioned. Upon the formation of the L.M.S.R. by amalgamation in 1923, he concentrated upon the extensive and intricate task of co-ordinating and eventually amalgamating the savings banks of its seven constituent companies to form the L.M.S.R. Savings Bank, on October 1, 1924.

We regret to learn of the death, on December 22, of Mr. Percy Grant, the Managing Director of Vickers Train Lighting Co. Ltd. Mr. Grant, who was in his 70th year, had been connected with Vickers Limited since 1917. He joined that company as the London representative of the Sheffield works, and in 1921 was appointed Special Director in control of Commercial Sales, while from 1922 to 1926 he was one of the Joint General Managers of the London office of the company. In 1928, in addition to his connection with the sale of Sheffield products, he assumed control of the Train Lighting Department, and on the formation of Vickers Train Lighting Co. Ltd. devoted his whole energies to the business of that company as Managing Director. Prior to his association with Vickers Limited, Mr. Grant spent many years in Argentina. He served 18 years with the Buenos Ayres Great Southern Railway, being for the last twelve years of his employment Chief Assistant Locomotive Superintendent. On his retirement in 1907 he commenced the business of Percy Grant & Company, in Buenos Aires.

The funeral took place at Golders Green crematorium on December 24.

In addition to the family mourners there were among those present the following:—

Mr. E. F. Ievers, Mr. C. W. C. Hine, Mr. W. H. Lawrence, Mrs. Fell-Clark, Mrs. Snowden, Mrs. John Dore, Mrs. Hickson, Mr. C. S. Williams, Mr. A. G. Moore, Major General and Mrs. Watts, Sir Hugh Dawson, Mr. and Mrs. Munk, General and Mrs. John Micklem, Mr. R. C. Rogers, Mr. R. Young, Mr. W. Gilmour Smith, Mr. N. Grant, Mrs. Beyfus, Colonel J. Beaumont Neilson, Mr. W. J. Husted, Mr. J. L. Roobottom, and Mrs. Howard Bonser.

Among the many flowers sent for the funeral were wreaths from Percy Grant & Company, from Mr. J. G. Mayne and from Mr. G. de Bourbel, all of Buenos Aires.

PRESENTATION TO MR. BUSHROD

At a meeting of the Railway Clearing House Superintendents' Conference held on December 16, Mr. E. Bushrod who recently retired from the position of Superintendent of Operation, Southern Railway, was the recipient of a presentation from the members of the conference, comprising a silver salver and silver sugar dredger.

Mr. C. J. Selway (Passenger Manager, Southern Area, L.N.E.R.), Chairman of the conference in making the presentation said that Mr. Bushrod had attended meetings at the Clearing House for upwards of 40 years and was Chairman of the Operating Superintendents' meetings during 1935 and had also acted in that capacity during the past year. He had always been regarded as an outstanding authority upon all matters of traffic working and his views on signalling problems and railway operation generally, commanded the greatest respect. In asking Mr. Bushrod to accept the presentation as a token of the esteem in which he was held by his colleagues, Mr. Selway said that, in doing so, he hoped Mr. Bushrod would feel that the memento was accompanied by the unanimous and warmest wishes of his old friends that he would be spared for many years to enjoy his retirement in good health and happiness.

Mr. Bushrod in thanking the members of the conference for their gifts, said that he looked upon them as cementing many long friendships, and they would also remind him of his happy associations with the representatives of other railway companies.

Mr. W. R. Cunningham has been appointed Vice-President of the Associated Equipment Co. of Canada Ltd.

We regret to note the recent death of Mr. Andrew Forbes Dick, Managing Director of the Brush Electrical Engineering Co. Ltd. Born in Edinburgh, he joined the National Telephone service at an early age, and rose to be Manager at Berwick-on-Tweed. Subsequently he made a name for himself in the Supplies Department of the British Westinghouse concern, and afterwards became Managing Director of Hobbell Way, a firm that was ultimately absorbed in the Turner & Newall Asbestos & Insulation group,

of which Mr. Dick then became a Director. His next important appointment was as a special advisory Director of Boulton & Paul Limited, and this firm he left to become Managing Director of the Brush Electrical Engineering Co. Ltd. about five months ago.

H.M. King George VI has been graciously pleased to confer his patronage on The Railway Convalescent Homes.

Lt.-Col. John Fleming, late R.E., and fourth Crown Agent for the Colonies, whose death we announced in our issue of September 18, left estate valued at £76,429.

CANADIAN NATIONAL RAILWAYS APPOINTMENTS

Mr. E. P. Mallory to be Executive Assistant to the President.

Mr. Maynard A. Metcalf to be Assistant to the President.

We regret to report the death, after a brief illness, on December 19, of Mr. Ian Samuel Osborn, a member of the well-known steel manufacturing family of Osborn. Although only 36 years of age, he was prominently associated with trade and with many other activities, and was a Director of Samuel Osborn & Co. Ltd., Clyde Steel Works.

PRESENTATION FOR HEROIC ACTION AT SEA

On board the London & North Eastern Railway ss. *Dewsbury*, lying at Hull, on December 18, Mr. A. L. Gibson, Continental Traffic Manager, L.N.E.R., made a presentation on behalf of the Associated Humber Lines to Capt. A. J. E. Snowden and other members of the crew of the steamer in recognition of their magnificent seamanship and heroism in rescuing the crew of the Dutch ms. *Albion* in heavy weather in the North Sea on October 25. Mr. Gibson handed over to Capt. Snowden a silver salver suitably inscribed; to 1st Officer T. E. Fea, a pair of binoculars; to Second Officer H. W. Abbott, a pair of binoculars; and seven members of the crew each received a cheque.

In making the presentation, Mr. Gibson referred to the manner in which the recipients, at risk of their lives, had upheld the finest traditions of the British Mercantile Marine, and on behalf of the control committee and the management of the associated lines—the L.N.E.R. Grimsby lines, the Hull & Netherlands Steamship Company, Goole Steam Shipping (L.M.S.R.), and Wilson's & N.E.R. Shipping Company—he thanked them for the credit they had brought to the associated lines, and congratulated them on their great gallantry.

INDIAN RAILWAY STAFF CHANGES

Mr. L. E. Brock has been confirmed as Deputy Chief Mechanical Engineer, N.W.R., as from October 1. He will, however, continue to be employed as

Divisional Superintendent on that system.

Mr. E. L. Manico has been confirmed provisionally as Deputy Chief Mechanical Engineer, N.W.R., as from October 1.

Mr. F. H. L. Strange has been confirmed provisionally as Deputy Chief Operating Superintendent, N.W.R., as from September 17.

L.M.S.R. APPOINTMENTS

The following appointments have been approved by the directors:—

Chief Commercial Manager's Department

Mr. A. L. Gregory, Chief Commercial Clerk (Mineral), Chief Commercial Manager's office, Derby, to be Assistant (Coal), Chief Commercial Manager's office, Euston.

Chief Operating Manager's Department

Mr. F. Sutton, Assistant District Controller, Birmingham, to be Assistant Divisional Controller (Freight Services), office of Divisional Superintendent of Operation, Crewe, from March 21.

Mr. R. B. Wingate, Assistant District Controller, Bletchley, to be Assistant District Controller, Birmingham.

Secretary's Department

Mr. H. A. Parkes, Chief Clerk and head of deposit section, Savings Bank office, Euston, to be Secretary of Savings Bank, Euston.

Chief Civil Engineer's Department

Mr. H. L. Douglas, Draughtsman, Edge Hill, to be Assistant (Dock and Harbour), Fleetwood.

AN APPRECIATION OF THE LATE

MR. R. D. GAULD

We have received from a correspondent the following appreciation of the late Mr. R. D. Gauld, Resident Engineer, Bridges, L.M.S.R., Manchester, who, as we recorded in our issue of December 25, met an untimely end at Brigham, Cumberland, on December 16, during the demolition of a bridge over the River Derwent.

Gauld was a man who endeared himself to everyone with whom he worked and had a charm that was all his own. After hours of rain and cold on works he could still summon up that pleasing smile, which wrinkled up round the corners of his eyes, either to labourers or others. His keenness for work was tremendous. As a comparatively young man he had, by his own efforts, a more than usually wide experience of railway engineering, and as a lecturer on that subject, a contributor to your journal and to other technical papers and institutions his work was appreciated and valued. He had a wonderful flair for collecting old and modern engineering books and cheerfully lending them to those who were interested, of which the writer had his full share.

We have lost one who could ill be spared, a courageous engineer, always sharing the place of danger with his men. His last words as he floated down

that cruel river in terrible spate were "look after Riddett," after which characteristic expression he very shortly met his end.

From *The London Gazette* of December 22:—

Regular Army Reserve of Officers; Royal Engineers

Lt. H. Pryce Jones from Supplementary Reserve of Officers, R.E., to be Lieutenant, retaining his present seniority (December 18).

Supplementary Reserve of Officers; Royal Engineers

2nd Lts. B. W. Ellis and G. N. Muir to be Lieutenants (December 2 and 9 respectively).

Arthur Gordon Hill to be 2nd Lieutenant (December 23).

From *The London Gazette* of December 29: Territorial Army, Royal Engineers; Engineer and Railway Staff Corps: Lt.-Col. R. Carpmael, O.B.E., M.Inst.C.E., M.I.Mech.E., to be Colonel, and Major A. Binns, M.Inst.C.E., to be Lieutenant Colonel (December 30). Col. Carpmael is Chief Engineer, G.W.R.

SOUTH AFRICAN STAFF CHANGES

Mr. W. E. Turnbull, System Manager, Durban, to be Assistant Chief Traffic Manager.

Mr. C. M. Hoffe, Chief Superintendent (Staff), to be understudy to the Chief Accountant.

Mr. G. J. Viljoen, System Manager, Johannesburg, to be System Manager, Bloemfontein.

Mr. J. D. White, System Manager, Port Elizabeth, to be System Manager, Durban.

Mr. P. D. Troskie, System Manager, Bloemfontein, to be Chief Superintendent (Staff), Headquarters.

Mr. W. Heckroodt, Superintendent (Operating), to be System Manager, Pretoria.

Mr. P. T. Steyn, Superintendent (Operating), to be System Manager, Port Elizabeth.

Mr. J. Rogan, Manager, Road Motor Services, to be Superintendent (Operating), Headquarters.

Mr. J. P. MacMagh, Superintendent (Operating and Commercial), Bloemfontein, to be Manager, Road Motor Services.

Mr. C. H. Teulon, Port Goods Superintendent, Durban, to be Superintendent (Operating), Durban.

Mr. C. W. Ballenden, System Engineer, Cape Town, to be Inspecting Engineer, Headquarters.

Mr. F. T. Bromley, System Engineer, Durban, to be System Engineer, Cape Town.

Mr. W. B. A. Ritchie, System Engineer, Port Elizabeth, to be System Engineer, Durban.

Mr. P. J. Louw, District Engineer, Durban, to be System Engineer, Port Elizabeth.

Mr. J. Viljoen, S.A.R. Agent, Lourenço Marques, to be Assistant Superintendent (Staff), Headquarters.

RAILWAY AND OTHER MEETINGS

Mexican Railway Co. Ltd.

The ordinary general meeting of the Mexican Railway Co. Ltd. was held at Winchester House, Old Broad Street, E.C.4, on December 23, Mr. Vincent W. Yorke, Chairman of the company, presiding.

The Secretary (Mr. C. Tennant) read the notice convening the meeting and the auditors' report.

The Chairman, in moving the adoption of the report and accounts, said that he regretted to have to say that there had been little, if any, change for the better in the company's affairs during the last six months, and that there was very little of a reassuring or encouraging nature to be said. There was no doubt as to the period of prosperity which Mexico was enjoying. She had a favourable trade balance of approximately £20,000,000, to which could be added a considerable sum in invisible imports derived from a constantly expanding tourist traffic. Her budget had been more than balanced for the last three years, and the output of oil, a very important source of revenue, was increasing. Added to all this, Mexico had the advantage of a steady exchange, which for the last three years had been stabilised with the U.S. dollar. Complete political tranquillity appeared to prevail, and the mining industry was being encouraged by the rising prices of all metals; the cotton mills were working more than full time to keep pace with the increased spending powers of the people. In fact the time would seem to have arrived when Mexico could begin to put her affairs in order and show some consideration to her long-suffering creditors, who had received next to nothing for very nearly 25 years.

The re-establishment of public credit would be to the immediate advantage of a country which was backward in many material respects, and badly needed foreign capital for development in many directions. Similarly a more conciliatory attitude towards public service companies, such as their own company, which had had to struggle for many years under appalling difficulties, would go some considerable distance towards the re-establishment, first of all of confidence and then of credit. Unfortunately, however, there was little evidence of any such recognition.

The increase of \$520,000 in gross traffic during the half-year under review was almost equally divided between passenger and goods traffic. Passenger traffic, however, showed the more marked increase of the two, namely 14.84 per cent., as compared with only 5.9 per cent. for goods. This was accounted for by a satisfactory accession of tourist traffic from the United States and by a big movement of native second-class traffic. The tonnage of foreign goods carried showed

an actual decrease of 9,300 tons, though the increase in revenue was nearly \$29,000. This was due to the company having carried nearly 15,000 tons of cast iron pipe in the first half of the year 1935, for which specially low rates had been quoted. The increase of \$236,000 in national goods traffic was fairly well distributed over different classes of products.

Unfortunately the increase in expenses shown in the accounts at \$1,051,000 was more than double the increase in receipts, though for purposes of strict comparison a deduction of \$308,000 should be made from this figure. In the first half of 1935 an allocation of 6 per cent. on gross receipts was made to the credit of special renewals, which was increased in this half year to 10 per cent. Still, even after this deduction had been made, it was clear that it had cost the company \$743,000 to earn an additional

\$520,000. The payment for the seventh day and other privileges that the company had had to grant to employees were almost entirely responsible for this very regrettable showing. The gross receipts for the current half-year again showed a satisfactory tendency and reached an increase of \$225,000 over the corresponding half-year, or rather more than 5 per cent. Expenses, however, which had been prepared on a strictly comparable basis, showed an increase of \$407,000, or more than 9 per cent., and there was no doubt that there would be an actual operating loss at the end of this half-year.

Though not much fault could be found with the company's permanent way, locomotives and both freight and passenger vehicles were not equal to the demands that the increased traffic was making upon them. A minimum programme called for the expenditure in the near future of not less than £300,000. Authorisation had already been given for the purchase of 50 new freight cars.

The report and accounts were adopted.

Pullman Car Co. Ltd.

The ordinary general meeting of the Pullman Car Co. Ltd. was held on December 17, at Victoria station, S.W.1, Sir Follett Holt, K.B.E., Chairman of the company, presiding.

The Secretary (Mr. E. Ashton) read the notice convening the meeting and the auditor's report.

The Chairman, in moving the adoption of the report and accounts, said that the board was glad to be able to report a further improvement on the figures presented last year. The profits from operating the cars had improved by about £1,000, and the interest charges having been reduced by £2,764, the earning position worked out at some £3,700 better than in the 1935 accounts. Furthermore, a year ago the company's obligations outstanding amounted to £191,000. This figure had since been reduced to £120,000 by the payment of £71,000 on account of the debt due to the manufacturers for the electric cars. Those 38 cars, with equipment, were purchased by the company four years ago at a cost of £212,172, and that large amount had since been paid off with the exception of £20,000 which it should be possible to meet within the next few months.

The fact that a large proportion of the increased receipts had been absorbed by working expenses was to some extent disappointing, but it was common knowledge that part at least of the efforts of the Government during the past few years had been devoted to the protection of the farming industry, a laudable policy but one which had to be paid for in the end, and the company had had to pay its share in an all-round increase in the cost of food requirements. Furthermore, to meet

demand services had been increased, more cars had been employed and pantry sets staffed, calling for additional men. Time was needed to show whether these new services would become remunerative.

The proposal of the L.N.E.R. to accelerate greatly with specially built express trains some of its services to Leeds and Edinburgh must to some extent affect the loading of the Queen of Scots and Yorkshire Pullman trains. The company had been informed, however, that the change would be brought about with as little prejudice as possible, so that the board was hopeful that what might be lost on the swings would be made up on the roundabouts.

On the Southern Railway the lines from Victoria to Bognor and Portsmouth via Horsham, and from Charing Cross to Hastings via Tunbridge Wells were being electrified. This would result in the displacement of steam cars working on these sections.

The changing requirements of the travelling public were causing the railways to make many alterations in their timetables and methods of transport, and where the Pullman Car Co. Ltd. was concerned new calls were being thrown upon its resources. These the company was endeavouring to meet with goodwill whenever it was possible to do so without imperilling its position.

The past year had seen the withdrawal of the interest the company had in Ireland. There, too, the railways were changing their methods and the company's position was becoming hazardous. The contract with the Great Southern Railways was nearing the end and had not been renewed.

Negotiations had resulted in the sale to that company of the four cars employed there. These had been written off in the accounts and the subsidiary company was being liquidated.

The shareholders were aware how hardly the company has been hit by the loss of Continental traffic during the past years of exchange and political confusions, and of air competition. An examination of the accounts showed that there had been at last an improvement in numbers and receipts in this important branch of the company's business, and it was to be hoped that nothing further would happen on the other side of the channel to disturb the long delayed improvement that had now set in.

During the past year six cars had been scrapped and one had been removed from the schedule at any rate temporarily by fire. The company now owned 222 cars. The oldest car was 28, the youngest 4. The average age was 11.69 years. The average expectation of life was estimated by the General Manager to be 17 years, but fortunately the company had a large number of modern cars running on the more remunerative services with a life well above this average. Today the average cost per car with equipment stood in the books at £5,580. This, in view of the average age, the

board knew to be too high and consequently there remained a gap between the real commercial value of the cars and the value in the books which was based on cost.

The board had, therefore, to be extremely careful when it came to the division of funds as between what in all the circumstances might be considered as revenue and capital, for to pay interest at the expense of capital obviously was to dig the grave of the latter, mainly for the benefit of the tax collector. For the past few years, the company had been dealing with the major problem of floating indebtedness, and, as this might now be said to be solved, the board with the help of the shareholders would have to decide upon the best way to solve the next problem which was the gap in the capital account. In dealing with this question all must bear in mind that the contract with the Southern Railway terminated in 25 years.

The Chairman closed his remarks by again recommending the good services of Mr. Griffith, the General Manager, Mr. Ashton, the Secretary, and the staff, for their efforts to preserve the good name and assets of the company.

The report and accounts were unanimously adopted, and the dividend of 3 per cent. on account of arrears on the preference shares was approved.

L.N.E.R. Carol Concert

The concert given by the L.N.E.R. Musical Society at the Queen's Hall, London, on December 19, was once again a magnificent exhibition of massed male voice singing. The full symphony orchestra of the society, numbering 100 members from London, took part. The massed male voice choirs, totalling some 400, were drawn from Cambridge (20), Doncaster (83), Grimsby (56), Ipswich (25), Lincoln (31), London (60), Norwich (28), Peterborough (33), and York (70). The society which was formed in 1908 with a view to promoting the friendly social intercourse of all sections of the company's service, has already given upwards of 190 concerts, besides assisting in a large number of other concerts in aid of charitable and patriotic purposes. The members of both the orchestra and choir are drawn from every rank in the company's service, and the massed male voice choir is now one of the largest in the world. The orchestra is unusual as an amateur organisation, inasmuch as it does not rely upon professional help in any section. Prior to the concert, a recital was given on the organ by Mr. T. E. Robinson, the Honorary Conductor of the York section of the Society. The whole of the programme was conducted by Mr. Leslie Woodgate, whilst the work of accompanying was shared by Mr. Sydney Harrington, F.R.C.O., and Mr. S. E. Macy, Mr. Harrington also taking the solo part in the first performance of a prelude and trumpet tune for organ and orchestra written by Leslie Wood-

gate. The choir was in excellent form and provided striking contrasts between the tremendous fortissimos and the delicate pianissimos.

G.W.R. Schemes for South Wales

The Great Western Railway announced on December 29 that it is to establish at a cost of £100,000 in the South Wales Special Area a centre for all carriage repair and painting work required in that area. Plans have been completed for a depot at Glamorgan to comprise a 30,000 sq. ft. carriage lifting shop; a shop of similar dimensions for repairs and painting; additional buildings for the same purpose covering an area of 26,000 sq. ft.; and the requisite stores and offices. The company has already spent £4,125,000 during the past seven years upon improvements in South Wales, and most of the substantial sum involved by the new scheme, which on completion will give full-time employment to upwards of 100 men, is to be spent in the same part of the country. In connection with this repair depot, the G.W.R. is to build carriage sheds at Cherry Orchard, between Caerphilly and Cardiff, to accommodate reconditioned stock not required for immediate service. More than 100 coaches will be accommodated in seven sidings, with sheds 1,000 ft. long and nearly 100 ft. wide. The railway is also negotiating in connection with the provision of an extension into the Treforest trading estate, with many factory sidings and a proposed passenger halt.

British and Irish Railways Stocks and Shares

Stocks	Highest 1935	Lowest 1935	Prices	
			Dec. 30, 1936	Rise Fall
G.W.R.				
Cons. Ord. ...	551½	441½	65	+2½
5% Con. Prefce ...	124	108	125½	—
5% Red. Pref.(1950) ...	117	106½	110½	—
4% Deb.	118½	108	113*	—
4½% Deb.	122	110	117½*	—
4½% Deb.	129½	118	124½*	—
5% Deb.	140½	130	136½*	—
2½% Deb.	82½	68½	75½*	—
5% Rt. Charge ...	137	128	133½*	—
5% Cons. Guar. ...	136½	120½	133	—
L.M.S.R.				
Ord.	255½	16	34	+2
4% Prefce. (1923) ...	58½	43½	81½	—
4% Prefce.	87½	73½	91½	—
5% Red. Pref.(1955) ...	107	97½	107	—
4% Deb.	110½	99½	107½	—
5% Red. Deb.(1952) ...	119½	111½	116½	—
4% Guar.	105½	95½	104½	—
L.N.E.R.				
5% Pref. Ord.	157½	8½	12	+½
Def. Ord.	79½	4½	6½	+½
4% First Prefce.	74½	48	77½	+½
4% Second Prefce.	31½	16½	29	—
5% Red. Pref.(1955) ...	92½	71	99½	+½
4% First Guar.	103½	93	102	—
4% Second Guar.	98½	82½	97½	—
3% Deb.	86	75	83½	—
4% Deb.	109½	98½	107	—
5% Red. Deb.(1947) ...	118½	106½	112½	—
4½% Sinking Fund Red. Deb.	112½	108	109½	—
SOUTHERN				
Pref. Ord.	87½	69½	96	+1
Def. Ord.	25½	16½	26	+1
5% Prefce.	124	108½	125	—
5% Red. Pref.(1964) ...	117½	109½	117½	—
5% Guar. Prefce.	136½	121½	133½	—
5% Red. Guar. Pref. (1957)	121½	112½	117½	—
4% Deb.	116½	107	112	—
5% Deb.	138	130½	135½	—
4% Red. Deb. 1962-67	115	106½	112	—
BELFAST & C.D.				
Ord.	9	4	5	-½
FORTH BRIDGE				
4% Deb.	111½	104½	104½*	—
4% Guar.	109½	104	104½*	—
G. NORTHERN (IRELAND)				
Ord.	20	7	12	—
G. SOUTHERN (IRELAND)				
Ord.	57½	14½	58½	—
Prefce.	50	25½	65	—
Guar.	88½	51½	94	—
Deb.	86½	70	95	-½
L.P.T.B.				
4½% "A"	130	119½	123½	-1
5% "A"	139½	130	135½	—
4½% "T.F.A."	113½	108	109	—
5% "B"	131½	122½	124½	-1
"C"	109½	91	98	+1
MERSEY				
Ord.	23½	9½	41½	+4
4% Perp. Deb.	100½	93½	101	—
3% Perp. Deb.	75½	67	77½	+1
3% Perp. Prefce.	62	47½	67½	—

* ex dividend

British and Irish Traffic Returns

GREAT BRITAIN	Totals for 52nd Week			Totals to Date		
	1936	1935	Inc. or Dec.	1936	1935	Inc. or Dec.
L.M.S.R. (6,916 mls.)						
Passenger-train traffic...	629,000	498,000	+ 131,000	25,775,000	25,075,000	+ 700,000
Merchandise, &c. ...	348,000	246,000	+ 102,000	23,952,000	23,518,000	+ 434,000
Coal and coke ...	239,000	188,000	+ 51,000	12,675,000	12,270,000	+ 405,000
Goods-train traffic ...	587,000	434,000	+ 153,000	37,607,000	35,788,000	+ 1,819,000
Total receipts ...	1,216,000	932,000	+ 284,000	63,379,000	60,867,000	+ 2,512,000
L.N.E.R. (6,332 mls.)						
Passenger-train traffic...	412,000	333,000	+ 79,000	16,784,000	16,422,000	+ 362,000
Merchandise, &c. ...	259,000	206,000	+ 53,000	17,030,000	16,440,000	+ 590,000
Coal and coke ...	187,000	183,000	+ 4,000	12,149,000	11,774,000	+ 375,000
Goods-train traffic ...	446,000	389,000	+ 57,000	29,179,000	28,214,000	+ 965,000
Total receipts ...	888,000	722,000	+ 136,000	45,963,000	44,636,000	+ 1,327,000
G.W.R. (3,746 mls.)						
Passenger-train traffic...	304,000	241,000	+ 63,000	10,935,000	10,679,000	+ 256,000
Merchandise, &c. ...	132,000	83,000	+ 49,000	9,967,000	9,487,000	+ 480,000
Coal and coke ...	86,000	75,000	+ 11,000	5,274,000	5,256,000	+ 18,000
Goods-train traffic ...	218,000	158,000	+ 60,000	15,241,000	14,743,000	+ 498,000
Total receipts ...	522,000	399,000	+ 123,000	26,176,000	25,422,000	+ 754,000
S.R. (2,153 mls.)						
Passenger-train traffic...	392,000	322,000	+ 70,000	15,954,000	15,588,000	+ 366,000
Merchandise, &c. ...	41,000	31,000	+ 10,000	3,251,500	3,180,000	+ 71,500
Coal and coke ...	30,000	29,000	+ 1,000	1,610,500	1,585,000	+ 25,500
Goods-train traffic ...	71,000	63,000	+ 8,000	4,862,000	4,765,000	+ 97,000
Total receipts ...	463,000	382,000	+ 81,000	20,816,000	20,353,000	+ 463,000
Liverpool Overhead (6 mls.)	998	942	+ 56	61,994	60,954	+ 1,040
Mersey (4 mls.)	4,809	4,482	+ 327	215,454	210,880	+ 4,564
*London Passenger Transport Board	535,600	488,600	+ 47,000	14,607,200	14,147,000	+ 460,200
IRELAND						
Belfast & C.D. (80 mls.)	2,091	2,201	- 110	129,313	128,742	+ 571
" " " " " "	515	249	+ 266	27,796	26,512	+ 1,284
" " " " " "	2,606	2,450	+ 156	157,109	155,254	+ 1,855
*Great Northern (543 mls.)	15,000	14,900	+ 100	554,750	535,550	+ 19,200
" " " " " "	6,550	5,600	+ 950	489,500	486,750	+ 2,750
" " " " " "	21,550	20,500	+ 1,050	1,044,250	1,022,300	+ 21,950
*Great Southern (2,067 mls.)	47,112	45,015	+ 2,097	1,844,460	1,791,655	+ 52,805
" " " " " "	36,996	27,452	+ 9,544	2,266,376	2,123,574	+ 142,802
" " " " " "	84,108	72,467	+ 11,641	4,110,836	3,915,229	+ 195,607

† 51st week.

* 26th week.

British and Irish Traffic Returns

GREAT BRITAIN	Totals for 51st Week			Totals to Date		
	1936	1935	Inc. or Dec.	1936	1935	Inc. or Dec.
L.M.S.R. (6,916 mls.)						
Passenger-train traffic...	487,000	543,000	- 56,000	24,581,000	24,581,000	+ 562,000
Merchandise, &c. ...	312,000	492,000	- 180,000	23,272,000	23,272,000	+ 1,312,000
Coal and coke ...	828,000	791,000	+ 37,000	12,082,000	12,082,000	+ 354,000
Goods-train traffic ...	1,315,000	1,334,000	- 19,000	35,354,000	35,354,000	+ 1,668,000
Total receipts ...	306,000	351,000	- 45,000	59,935,000	59,935,000	+ 2,228,000
L.N.E.R. (6,332 mls.)						
Passenger-train traffic...	352,000	344,000	+ 8,000	16,089,000	16,089,000	+ 283,000
Merchandise, &c. ...	282,000	280,000	+ 2,000	16,234,000	16,234,000	+ 371,000
Coal and coke ...	634,000	624,000	+ 10,000	11,591,000	11,591,000	+ 371,000
Goods-train traffic ...	940,000	975,000	- 35,000	27,825,000	27,825,000	+ 908,000
Total receipts ...	216,000	243,000	- 27,000	43,914,000	43,914,000	+ 1,191,000
G.W.R. (3,746 mls.)						
Passenger-train traffic...	192,000	192,000	+ 0	10,438,000	10,438,000	+ 193,000
Merchandise, &c. ...	122,000	126,000	- 4,000	9,835,000	9,835,000	+ 431,000
Coal and coke ...	339,000	318,000	+ 21,000	5,181,000	5,181,000	+ 7,000
Goods-train traffic ...	555,000	561,000	- 6,000	15,023,000	15,023,000	+ 438,000
Total receipts ...	303,000	325,000	- 22,000	25,023,000	25,023,000	+ 631,000
S.R. (2,153 mls.)						
Passenger-train traffic...	62,000	60,000	+ 2,000	15,266,000	15,266,000	+ 296,000
Merchandise, &c. ...	38,000	41,000	- 3,000	3,210,500	3,210,500	+ 61,500
Coal and coke ...	100,000	101,000	- 1,000	1,580,500	1,580,500	+ 24,500
Goods-train traffic ...	403,000	426,000	- 23,000	4,791,000	4,791,000	+ 86,000
Total receipts ...	1,233	1,195	+ 38	19,971,000	19,971,000	+ 382,000
Liverpool Overhead (6 mls.)	4,783	4,970	- 187	60,996	60,912	+ 84
Mersey (4 mls.)	603,600	582,300	+ 21,300	210,645	206,408	+ 4,237
*London Passenger Transport Board	1,638	1,874	- 236	14,071,600	13,658,400	+ 413,200
IRELAND						
Belfast & C.D. (80 mls.)	494	599	- 105	127,222	126,541	+ 681
" " " " " "	2,132	2,473	- 341	27,281	26,263	+ 1,018
" " " " " "	9,300	10,800	- 1,500	154,503	152,804	+ 1,699
*Great Northern (543 mls.)	8,550	10,250	- 1,700	539,750	520,650	+ 19,100
" " " " " "	17,850	20,750	- 2,900	482,950	481,150	+ 1,800
" " " " " "	33,640	37,096	- 3,456	1,022,700	1,001,800	+ 20,900
*Great Southern (2,067 mls.)	62,778	62,113	+ 665	1,797,348	1,746,640	+ 50,708
" " " " " "	96,418	99,209	- 2,791	2,229,380	2,096,122	+ 133,258
" " " " " "				4,026,728	3,842,762	+ 183,966

† 50th week.

* 25th week.

NOTES AND NEWS

The Continental Summer Timetables, 1937.—As Whitsun Day falls on May 16 in 1937, the Continental summer timetables will come into force this year on Saturday, May 22, instead of the usual date of May 15.

Barranquilla Railway & Pier Co. Ltd.—A petition for the reduction of the capital of this company from £656,250 to £600,000 was presented to the High Court of Justice on November 5, 1936, and is now pending.

Decision of the Railway Staff National Tribunal.—It is expected that the decision of the Railway Staff National Tribunal upon the claims of the Associated Society of Locomotive Engineers and Firemen, which were heard in London on December 7, 8, 9, and 12, will be published on Tuesday next, January 5.

Indian Railway Purchase Deferred.—The directors of the Bengal & North Western and of the Rohilkund & Kumaon Railway Companies received on December 23 last an intimation from the Secretary of State for India that he does not propose to exercise his option under the respective contracts with those companies of purchasing their railways on December 31, 1937.

Bouts-Tillotson "A" Licences.—The hearing before the Transport Appeal Tribunal of the appeal by the four main line railway companies against the award of "A" licences for 128 vehicles by the Metropolitan Licensing Authority to Bouts-Tillotson Transport Limited, was concluded on December 23, 1936. Mr. Rowand Harker, K.C., who presided, said that the decision of the tribunal would be reserved until the end of this month.

Central Railway of Chubut.—At an extraordinary general meeting of the Central Railway of Chubut Co. Ltd., held at River Plate House, E.C., on December 18, 1936, a resolution was passed that the company be voluntarily wound up, that Mr. H. C. Withers be appointed liquidator, and that Lt. Col. Walter Woodbine Parish and Mr. Louis Paine be appointed a committee to confer with the liquidator in all matters concerning the winding-up of the company.

The Highest Cableway in the World.—A new cableway is to be constructed by the Austrian Government in Carinthia to connect the recently-opened southern section of the Grossglockner mountain road with the Fuscherkarkopf, whence tourists obtain a fine panoramic view of more than 50 snow peaks all over 10,000 ft. in altitude. The cableway will rise from 800 to 10,500 altitude, and will span a large glacier with a clear (unsupported) span nearly a mile in length. A modern hotel is to be built at the Fuscherkarkopf and work upon the cableway is likely, states

a Reuters message from Vienna, to be begun in the spring and be completed within a year. It will be the highest in the world.

New Grand Union Canal Address.—As from December 29, the registered office of the Grand Union Canal Carrying Co. Ltd. has been at Sackville House, 149, Fenchurch Street, London, E.C.3.

L.N.E.R. Musical Society.—The combined orchestral and vocal forces of the L.N.E.R. Musical Society have arranged to give concerts in the City Hall, Newcastle-upon-Tyne, on Saturday evening, March 6, and in the Spa Hall, Scarborough, on the afternoon of Sunday, March 7.

Oriental Railways Nationalised.—It is reported from Istanbul that the Turkish Government has entered into an agreement to take over as from to-day (January 1) the undertaking of the Oriental Railways Company, a French company that works the railways in European Turkey extending from the Bulgarian frontier to Istanbul. A sketch map and brief particulars of the system were published on page 1203 of our issue of June 26 last.

Improving Financial Position of Indian Railways.—A message from *The Times* correspondent in Delhi states that at present Indian railway accounts show an increase in revenue of Rs. 1,25,00,000 (£937,500) over the Budget estimate, a figure that is likely to become Rs. 1,50,00,000 (or £1,125,000) by the end of the financial year (March 31). Future policy to take advantage of this improvement, will, however, be determined by the Wedgwood Committee report.

Stratfordians' Association.—The Stratfordians' Association (comprising past and present staff of the C.M.E. Department of the L.N.E.R., Stratford) proposes to hold a re-union dinner in the Abercorn Rooms of the Great Eastern Hotel, Liverpool Street, on Friday, January 29. Major C. C. B. Morris, Chief of the London Fire Brigade, is to take the Chair. Full particulars may be obtained from the Honorary Secretary of the association, Mr. A. W. Headley, C.M.E. Department, L.N.E.R., Stratford, London, E.15.

Quadrupling the P.L.M. Main Line.—At the present time there are four tracks available for trains on the P.L.M. main line as far as Villeneuve-La-Guyard, 89 km. (55½ miles) from Paris, and for 60 km. (37¼ miles) between Sens and Saint-Florentin. The 23 km. (14½ miles) between Villeneuve-La-Guyard and Sens is at present being widened to four lines, as well as another section of 31 km. (19½ miles), between Les Laumes-Alésia and Blaisy-Bas. In connection with the latter, a general scheme of realignment to ease curvature is being undertaken and in some places the new four-track line is more than

75 m. away from the existing formation. It is expected that the whole of this work will be completed early in 1938. The new permanent way is laid with 62 kg. (124 lb.) rails, and automatic signalling will be installed.

New Seven-Car Zephyrs.—The three-car diesel-electric Burlington Zephyr trains, which have been working the Twin Cities service of the Chicago, Burlington and Quincy Railroad since April, 1935, were replaced on December 18 by two new seven-car twin Zephyrs built by the Edward G. Budd Manufacturing Company. The power car is in effect a 1,800-h.p. diesel-electric locomotive built by the Electro-Motive Corporation. The original Zephyrs are being placed in other services.

Further Sunday Cheap Travel.—Beginning on Sunday, January 3, the G.W., L.M.S., and L.N.E. Railways will introduce experimentally cheap Sunday return tickets between any two stations in England and Wales on the lines of these companies, or on lines jointly owned by one or more of them. Fares will be at about the third class single rate, with first class fares 50 per cent. higher. The minima will be 3s. 9d. first class and 2s. 6d. third class, and availability will be outwards at or after midnight on Saturday, and return by any train up to midnight on Sunday. The return journey may be made by any recognised route of any of the three companies.

Road Accidents.—The Ministry of Transport return for the week ended December 26, 1936, is as follows. The figures in brackets are those for the corresponding period of 1935:—

	Killed, including deaths resulting from previous accidents	Injured
England	136 (122)	4,048 (3,151)
Wales	5 (8)	145 (116)
Scotland	17 (15)	361 (257)
	158 (145)	4,554 (3,524)

The total fatalities for the previous week were 191, compared with 108 for the corresponding period of 1935.

Railway Freight Rebates Scheme.—The Railway Rates Tribunal on December 18, 1936, settled the new form of the Railway Freight Rebates Scheme to apply as from to-day (Friday). The Tribunal estimated the rate-relief in respect of the period January 1, 1937, to September 30, 1937, at £1,747,000, and considered that £1,186,951 would be available for payment of rebates during that period. Rebates in respect of agricultural traffics are to be at the rate of 14½ per cent. of the carriage charges or tolls, and in respect of exported coal class traffics at the rate of 1½d. a ton and 20 per cent. of the remainder of the carriage charges, or where the charge is a toll 25 per cent. of the toll. The surplus at the end of the nine months was estimated at £59,523. Evidence had been submitted to the Court by Mr. W. V. Wood, Vice-President, L.M.S.R.

OFFICIAL NOTICES

IMPROVEMENTS in and relating to Steam Auxiliary Blower and Over-Grate Air Control Gear for Smoke-Consuming Devices, more particularly for use on Locomotives. The Proprietor of British Patent No. 390,280 desires to arrange for the commercial working of this patent by sale outright or by licences granted on participating and reasonable terms. Particulars obtainable from TECHNICAL RECORDS LIMITED, 59-60, Lincoln's Inn Fields, London, W.C.2.

WANTED—A young Engineer, age between 24/30, as personal assistant to Assistant Managing Director. Unique opportunity for the right man. Preference will be given to Public School Boys with actual shop experience and/or University training. Apply by letter stating age, previous experience and salary required, to ASSISTANT MANAGING DIRECTOR, MESSRS. CHARLES ROBERTS & CO., LTD., Railway Wagon Works, near Wakefield.

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CONTRACTS AND TENDERS

1937 Renewal Programmes

At the time of going to press the G.W.R., L.M.S.R., and L.N.E.R. have issued their programmes of new works and renewals to be undertaken during the next twelve months. Many of the items have already been announced from time to time in THE RAILWAY GAZETTE.

The G.W.R. plans for rolling stock renewals, involving an expenditure of £2,000,000, were set out in THE RAILWAY GAZETTE for November 20. The G.W.R. programme also includes station improvements, bridge and viaduct reconstruction, and the relaying of 400 miles of track.

The L.M.S.R. will spend £7,650,000 on major replacements and improvements. This will involve the building of 105 locomotives, 210 locomotive boilers, 751 coaches, 12,305 wagons, 405 containers, 500 motor vehicles, and 500 trailers. Permanent way renewals will affect 835½ miles of track, 614½ miles of which will be entirely relaid.

The L.N.E.R. scheme provides for 121 new locomotives, 652 carriages, and 16,218 wagons. A number of heavy engineering works will be undertaken some of which, such as the Sheffield-Manchester electrification, which has already been announced in THE RAILWAY GAZETTE, will be financed under the terms of the Government Assistance Loan. The permanent way renewal programme involves some 293 miles of running lines.

[We hope to publish these programmes in detail next week, together with any further announcements that may be made during the next few days.]

George Turton, Platts & Co. Ltd. and the Exors. of James Mills share in the L.M.S.R. orders for steel keys forming part of the 1937 renewal programme referred to above.

Orders are now being sent to England for material required for the new railway to link up Nanking with Canton via the Canton-Hankow Railway, an agreement for which was signed with Jardine Matheson & Co. early in December. The total amount to be expended in Great Britain is estimated at £900,000. The new line referred to is the Kiangnan Railway, now being constructed to connect Nanking-Wuhu-Sunchiapu-Kweichi, and the link with Canton is continued via the Chekiang-Kiangsi and Canton-Hankow lines. The transaction is understood to be being financed jointly by the Hong-Kong & Shanghai Banking

Corporation and the British Boxer Indemnity Trustees.

The Drewry Car Co. Ltd. has received orders for seven diesel railbuses for the Argentine North Eastern Railway, and one for the Entre Rios Railways. These railbuses will be fitted with single 6LW Gardner engines, and the standard Drewry arrangement of power bogie with Wilson-Drewry gearbox and Vulcan-Sinclair hydraulic coupling. The railbuses are for standard gauge service, will have seating accommodation for 40 passengers, space for approximately two tons of luggage, an overall length of 47 ft. 6 in., and an approximate length of 20½ tons.

The Drewry Car Co. Ltd. has also received an order from the Buenos Ayres Great Southern Railway for a 6LW Gardner-engined power bogie to be used as a spare in connection with the order for 99 diesel railcars which, as announced on this page in our issue of December 4, has been received by the Drewry Car Co. Ltd. from the Buenos Ayres Great Southern and Buenos Ayres Western Railways.

L.N.E.R. Orders for Coal Wagons

The L.N.E.R. has ordered a total of 1,200 all-steel hopper coal wagons, divided as follows: the Metropolitan-Cammell Carriage & Wagon Co. Ltd., 400; Head, Wrightson & Co. Ltd., 400; the Birmingham Railway Carriage & Wagon Co. Ltd., 200; and Hurst, Nelson & Co. Ltd., 200.

L.N.E.R. Orders for Motor Vans

The L.N.E.R. has placed contracts with the undermentioned firms for the supply of motor vans for the company's road cartage business:—

Express Motor & Body Works Limited: Six 20-cwt. Commer N.1. F.C. chassis and parcels van bodies.

Scammell Lorries Limited: 39 M.H.3 3-ton Scammell tractor units; 10 M.H.6 6-ton Scammell tractor units; 34 3-ton long low-load fixed-sided trailers; 23 long 6-ton flat platform trailers; two short 6-ton platform trailers with H.D. sides; 10 short 6-ton fixed-sided trailers.

Cranes (Dereham) Limited: 30 3-ton long low-loading platform trailers; 21 3-ton long low-loading fixed-sided trailers.

R. A. Dyson & Co. Ltd.: 30 3-ton low-loading platform trailers (long).

H. W. Ward & Co. Ltd. has received an order from the Egyptian State Railways Administration for two brass finishing lathes.

Urquhart Lindsay & Robertson Orchard Limited has received an order from the Egyptian State Railways Administra-

tion for one carriage axle journal returning and burnishing lathe.

Andrew Barclay & Sons Ltd. has received an order from the War Department for two diesel-mechanical shunting locomotives to be powered by 150-b.h.p. Gardner engines.

Murex Welding Processes Limited has received an order from the Chinese Government Purchasing Commission, to the inspection of Messrs. Fox & Mayo, for the supply of welding plant and materials for the Tientsin-Pukow Railway.

The Associated Equipment Co. Ltd. has received orders from the British Columbia Electric Railway for two 115-b.h.p. oil engines and from the Ottawa Electric Railway for three similar engines for installation in passenger buses.

The Bombay, Baroda & Central India Railway Administration has placed the following orders to the inspection of Messrs. Rendel, Palmer & Tritton:—

Johnson & Phillips Limited, 14,000 yards of cable for power signalling.

Siemens & General Railway Signal Co. Ltd., 39 colour light signals and a quantity of colour light signalling material.

British Isothermos Co. Ltd., 54 Isothermos axle boxes for locomotive tenders.

The Egyptian State Railways Administration has recently placed the following orders:—

Skoda Works, Axles (Ref. No. E.S.R. 21,548, total price £459, delivery f.o.b. Hamburg or Trieste).

G. Salter & Co., Springs (Ref. No. E.S.R. 21,559, delivery f.o.b. English port).

Automatic Telephones & Electric Co. Ltd., Switchboard materials (Ref. No. E.S.R. 34,679, items 1-17, total cost £302, delivery f.o.b. English port).

Ericsson Telephones Limited, Switchboard materials (Ref. E.S.R. 34,679, items 18-27, total cost £179).

L. M. Ericsson Company, Lead covered enamel cable (Ref. E.S.R. 330 Gs/s, total cost approximately £16,523, delivery f.o.b. Stockholm).

Locomotives Required for India

Tenders are invited, receivable by March 5, at the office of the Director, Mechanical Engineering, Railway Board, New Delhi, for the following types of I.R.S. broad-gauge locomotives required for the East Indian and North Western Railways, for delivery between April 1, 1937, and March 31, 1938:—

Four I.R.S. XL 4-6-2 tender locomotives.

Four I.R.S. XU 2-4-2 tank locomotives.

Four I.R.S. XV 2-6-2 tank locomotives.

Four I.R.S. XW 0-6-2 tank locomotives.

Duplicate copies of the tenders must be submitted to the Director-General, India Store Department, London, before 10 a.m., March 5.

Railway Share Market

Home railway stocks have been active at higher prices, largely as a result of the excellent traffic figures for Christmas week, but sentiment was also influenced by confident anticipations that recovery in internal trade conditions will make further good progress in 1937.

L.M.S.R. 4 per cent. preference and 1923 preference were higher and the ordinary stock showed a rise to 34 on the traffic gain of £284,000 for the past week. The belief continues in the market that the ordinary stock will re-enter the dividend list with a payment of at least 1 per cent. for 1936. Great Western ordinary was also good, there having been a rise to 65 in response to the gain in the week's traffic, which in this case was £123,000. Southern deferred was higher at 26½ on the £81,000 rise in last week's traffic, which has tended to revive hopes that

this stock may receive a fractional payment for the year. The preferred was also better at 95½. L.N.E.R. issues participated in the upward movement (the traffic gain was £136,000 for the week) and the first preference is now 77 on growing expectations that this stock will receive its full 4 per cent. as against only 3½ per cent. paid for the previous year. The second preference was steadier at 29 and there was a better tendency in the preferred and deferred stocks, largely in response to growing hopes that traffic returns over the next few weeks will continue to be favourable. London Transport "C" showed improvement, although the gain of £47,000 in the past week's receipts was below expectations. The new Railway Freight Rebates loan has changed hands some 2½ points over the issue price of 94½. Argentine railway

stocks were again active and the general tendency was to higher prices, although profit-taking sales resulted in fluctuations from time to time. Central Argentine ordinary and preference stocks were in renewed request, partly owing to satisfaction with the traffic. B.A. Gt. Southern issues were also active, as were those of the B.A. Pacific and B.A. Western, although in these cases traffic did not show as good a rate of increase. Cordoba Central stocks showed a general rise following the announcement of the terms of purchase of the line. Entre Rios debentures rose sharply in price.

Antofagasta continued in demand and moved to close on 25 on the better outlook for the nitrate industry, but Nitrate Rails did not keep best prices. Among Brazilians, San Paulo was good with a rise of three points to 86. Canadian Pacific ordinary and preference stocks were better on the upward trend in the price of wheat and the favourable views current as to the outlook for the railway's traffic.

Traffic Table of Overseas and Foreign Railways Publishing Weekly Returns

	Railways	Miles open 1935-36	Week Ending	Traffic for Week		No. of Weeks	Aggregate Traffic to Date			Shares or Stock	Prices					
				Total this year	Inc. or Dec. compared with 1935		Totals		Increase or Decrease		Highest 1935	Lowest 1935	Dec. 30, 1936	Yield % (See Note)		
							This Year	Last Year								
South & Central America.	Antofagasta (Chili) & Bolivia	834	27.12.36	17,480	+	5,530	52	735,530	656,010	+	79,520	Ord. Stk.	23	141½	26	Nil
	Argentine North Eastern	753	26.12.36	7,320	+	752	26	239,925	210,893	+	29,032	"	7	4	11½	Nil
	Argentine Transandin	—	—	5,000	—	1,000	48	68,600	66,600	+	2,000	A. Deb.	49½	30	67½	51½
	Bolivar	174	Nov., 1936	—	—	—	—	—	—	—	—	6 p.c. Deb.	13	5	7½	3
	Brazil	—	—	—	—	—	—	—	—	—	—	Bonds	14	11	16	—
	Buenos Ayres & Pacific	2,806	26.12.36	100,186	+	19,457	26	2,020,638	1,945,930	+	74,708	Ord. Stk.	101½	47½	17	Nil
	Buenos Ayres Central	190	12.12.36	147,600	+	27,500	24	13,465,100	12,932,700	+	532,400	Mt. Deb.	21	10	33½	Nil
	Buenos Ayres Gt. Southern	5,084	26.12.36	147,581	+	14,561	26	3,014,659	3,116,706	—	102,047	Ord. Stk.	27	13½	31½	Nil
	Buenos Ayres Western	1,930	26.12.36	57,506	+	13,088	26	1,107,399	1,071,595	+	35,804	"	24	10	30½	Nil
	Central Argentine	3,700	26.12.36	155,664	+	30,535	26	3,638,402	3,042,383	+	591,019	"	177½	7	33	Nil
	Do.	—	—	—	—	—	—	—	—	—	—	Ord.	9	31½	20	Nil
	Cent. Uruguay of M. Video	273	12.12.36	12,523	+	382	24	287,324	239,639	+	47,685	Ord. Stk.	81½	3	7	Nil
	Do. Eastern Extn.	311	12.12.36	2,571	+	306	24	47,576	39,317	+	8,259	"	—	—	—	—
	Do. Northern Extn.	185	12.12.36	1,235	—	159	24	33,391	28,300	+	5,091	"	—	—	—	—
	Do. Western Extn.	211	12.12.36	834	—	57	24	23,597	18,689	+	4,908	"	—	—	—	—
	Cordoba Central	1,218	26.12.36	28,410	+	4,850	26	840,000	783,150	+	56,850	Ord. Inc.	4	1	6	Nil
	Costa Rica	188	Oct., 1936	19,226	+	7,592	18	71,989	55,349	+	16,640	Stk.	35	30	36	59½
	Dorada	70	Nov., 1936	14,800	+	1,500	48	156,500	130,700	+	25,800	1 Mt. Db.	103½	102½	104½	54
	Entre Rios	810	26.12.36	13,002	+	1,762	26	333,100	298,024	+	35,076	Ord. Stk.	15	6½	16½	Nil
	Great Western of Brazil	1,082	26.12.36	9,700	—	1,100	52	425,800	417,300	+	8,500	Ord. Sh.	1½	3½	3½	Nil
	International of Cl. Amer.	794	Oct., 1936	2,234,126	—	591	44	74,223,770	33,843,882	+	3379,888	Ord. Sh.	1½	3½	3½	Nil
	Interoceanic of Mexico	—	—	—	—	—	—	—	—	—	—	1st Pref.	1½	5½	1½	Nil
	La Guaira & Caracas	221	Nov., 1936	4,625	+	1,365	48	50,475	41,145	+	9,330	S. k.	81½	8	7½	Nil
	Leopoldina	1,918	26.12.36	24,263	+	7,509	52	1,036,441	929,973	+	106,468	Ord. Stk.	81½	21½	61½	Nil
	Mexican	483	21.12.36	245,206	—	112,000	25	16,640,200	16,231,100	+	409,000	"	11½	14	34	Nil
	Midland of Uruguay	319	Nov., 1936	8,878	—	453	22	41,109	31,964	+	9,145	"	11½	12	12	Nil
Nitrate	397	15.12.36	2,762	—	4,199	50	112,306	146,582	—	34,276	Ord. Sh.	64½	42½	27½	Nil	
Paraguay Central	274	26.12.36	2,936,000	+	279,000	26	267,219,000	258,539,000	+	8,680,000	Pr. Li. Stk.	80½	60	84	7½	
Peruvian Corporation	1,059	Nov., 1936	70,222	—	5,903	22	409,273	375,790	+	33,458	Pref.	106½	67½	114	Nil	
Salvador	100	19.12.36	27,350	+	6,550	25	232,858	232,496	—	2,638	Pr. Li. Db.	65	61	15	Nil	
San Paulo	1531	20.12.36	28,835	+	999	51	1,497,782	1,253,457	+	244,325	Ord. Stk.	80	35	86½	27½	
Taitai	164	Nov., 1936	4,390	+	385	22	16,810	16,845	—	165	Ord. Sh.	111½	11½	11½	87½	
United of Havana	1,353	26.12.36	19,437	+	3,808	26	411,725	400,212	+	11,513	Ord. Stk.	31½	1	2½	Nil	
Uruguay Northern	73	Nov., 1936	1,268	+	131	22	5,031	3,715	+	1,316	Deb. Stk.	4½	21½	5½	Nil	
Canada.	Canadian National	23,613	21.12.36	750,935	+	52,768	51	36,100,563	33,709,141	+	2,391,422	—	—	—	—	—
	Canadian Northern	—	—	—	—	—	—	—	—	—	—	Perp. Dbs.	78½	52½	74½	57½
	Grand Trunk	—	—	—	—	—	—	—	—	—	—	4 p.c. Gar.	103½	93	102½	37½
India.	Canadian Pacific	17,720	21.12.36	588,600	+	58,000	51	26,958,200	25,245,460	+	1,712,800	Ord. Stk.	141½	85	15	Nil
	Assam Bengal	1,329	31.11.36	42,007	+	3,595	35	880,957	826,646	+	54,321	Ord. Stk.	92½	77½	85½	3½
	Barsi Light	202	30.11.36	7,590	+	2,707	35	78,165	94,440	—	16,275	Ord. Sh.	105	77½	66½	7½
India.	Bengal & North Western	2,107	10.12.36	80,989	+	8,126	36	523,741	486,382	+	37,359	Ord. Stk.	301½	291	312	5½
	Bengal Dovers & Extension	161	10.12.36	3,973	—	3,7	36	93,692	99,534	—	5,842	"	127½	122	119½	57½
	Bengal-Nagpur	3,268	10.12.36	179,175	+	20,069	36	4,160,663	4,397,510	—	236,847	"	105	100½	101½	31½
	Bombay, Baroda & Cl. India	3,072	20.12.36	279,000	+	33,750	37	5,937,450	5,716,575	+	220,875	"	115½	110	110½	37½
	Madras & Southern Mahratta	3,229	30.11.36	151,950	+	18,371	35	3,531,038	3,523,596	+	7,442	"	128½	113½	107½	71½
	Rohilkund & Kumaon	572	10.12.36	14,943	+	633	36	88,789	93,831	+	4,958	"	294	282	307	57½
	South Indian	2,532	20.11.36	94,709	+	2,266	34	2,573,264	2,552,263	+	21,001	"	119½	104½	101½	57½
Various.	Beira-Untali	204	Oct., 1936	61,505	+	2,758	5	68,505	65,747	+	2,758	—	—	—	—	—
	Bilbao River & Cantabrian	15	Nov., 1936	341	—	1,559	48	14,949	16,953	—	2,004	—	—	—	—	—
	Egyptian Delta	820	10.2.36	8,211	—	911	36	174,138	173,483	+	655	Prf. Sh.	2	16½	15½	61½
	Great Southern of Spain	104	29.8.36	568	—	2,514	35	33,629	62,623	—	28,994	Inc. Deb.	3½	2	3½	Nil
	Kenya & Uganda	1,625	Nov., 1936	190,145	+	6,878	43	2,319,197	2,186,377	+	132,820	B. Deb.	48	36	46½	7½
	Manila	—	—	—	—	—	—	—	—	—	—	1 Mg. Db.	104½	100	105	44
	Mashonaland	913	Oct., 1936	125,267	+	13,284	5	125,267	111,983	+	13,284	Inc. Deb.	98½	93	94½	41½
	Midland of W. Australia	277	Nov., 1936	3,196	—	1,323	22	67,261	63,781	—	1,520	"	—	—	—	—
	Nigerian	1,905	14.11.36	77,128	+	12,027	32	1,165,413	936,025	+	229,388	4 p.c. Db.	105½	101	105	31½
	Rhodesia	1,538	Oct., 1936	229,964	+	27,270	5	229,964	202,694	+	27,270	"	—	—	—	—
	South Africa	13,263	5.12.36	678,514	+	34,608	35	21,814,907	20,150,996	+	1,663,911	"	—	—	—	—
	Victoria	4,728	Sept., 1936	790,314	—	994	13	2,242,629	2,238,853	+	3,776	"	—	—	—	—
Zafra & Huelva	112	Oct., 1936	14,665	+	1,978	44	80,613	114,122	—	33,509	"	—	—	—	—	

NOTE.—Yields are based on the approximate current prices and are within a fraction of 1½.

† Receipts are calculated at 1s. 6d. to the rupee. ‡ ex dividend. Salvador and Paraguay Central receipts are in currency.

The variation in Sterling value of the Argentine paper peso has lately been so great that the method of converting the Sterling weekly receipts at the par rate of exchange has proved misleading, the amount being overestimated. The statements from July 1 onwards are based on the current rates of exchange and not on the par value.